The Real Wilderness Idea

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Abstract—In recent years, some philosophers, historians and literary critics have condemned the "Received Wilderness Idea." Close examination reveals that this Received Wilderness Idea is a literary/philosophical construct little related to the Real Wilderness Idea that conservationists have used to establish the National Wilderness Preservation System. Analysis of the origin of the word "wilderness," the meaning of the Wilderness Act and the history of the conservation movement show the Real Wilderness Idea and the National Wilderness Preservation System to be robust.

I come not to praise The Received Wilderness Idea, but to bury it. The very name, "The Received Wilderness Idea," conjures up a mystical origin. If the Wilderness Idea that Baird Callicott, Bill Cronon and other postmodern deconstructionist scholars so eagerly banish with Milton's Lucifer has been received, I think it has been received as they hold hands in a darkened room around a seance table, trying to hear voices from the misty shades of Jonathan Edwards and Henry David Thoreau.

But, first, why should you lend me your ears on the idea of wilderness? Well, it's because I'm an expert on the Real Wilderness Idea—the one that created the National Wilderness Preservation System. I've been a wilderness backpacker for 40 years, a wilderness river runner for more than 30. During the several thousand days and nights I've spent in wilderness for fun and for conservation, I've had a few hundred companions (not all at once!). I've heard their thoughts about wilderness while plodding up dusty switchbacks, floating past canyon walls aglow in sunset flame and passing Scotch around the campfire. On many of these trips, my friends and I were checking out the wilderness qualities of unprotected areas and putting together boundary proposals to send to Congress for designation. In the 1970s, I wrote a widely-used guide, "How To Do A Wilderness Study." From all this, I got a very clear idea of wilderness, one that is widely shared with other conservationists doing the same thing.

In 1971, as I dove into wilderness issues in New Mexico, I found a complete set of The Wilderness Society's magazine, *The Living Wilderness,* in the basement of the University of New Mexico library. I read every issue all the way back to the first ones in the 1930s. During the early 1960s, *The Living Wilderness* covered the campaign for the Wilderness Act in great detail, including the arguments for and against wilderness protection. Since then I have read uncounted magazines, newsletters and action alerts from many wilderness protection groups. I have read dozens upon dozens of brochures and maps about wilderness areas from government agencies.

My mentors in the conservation movement were people who had led the campaign for the Wilderness Act and later efforts to protect mandate areas (Forest Service Primitive Areas and National Park and Wildlife Refuge roadless areas) and Forest Service roadless areas. I was trained as a grass-roots organizer by Clif Merritt, who organized Westerners to support the Wilderness Act, Ernie Dickerman, who wrote the Eastern Wilderness Areas Act, and Harry Crandell, who wrote the wilderness provision for the BLM organic act. Dave Brower, Ed and Peggy Wayburn, Stewart Brandborg and Celia Hunter taught me about wilderness battles stretching back to the 1930s. I talked at length with old-timers in Silver City, New Mexico, who had led the successful citizen fight against the Forest Service's proposed dismembering of the Gila Wilderness in 1952 (to allow logging). I have been privileged to know Bob Marshall's brothers, Aldo Leopold's daughter, Mardie Murie (Olaus Murie's widow) and Sig Olson. I applied their experience and wisdom when I became a national leader in the wilderness campaigns on RARE II, the BLM wilderness review and the Alaska Lands Act.

I have sat through dozens of public hearings—agency and congressional, field and DC—about wilderness area designation. I believe I have known people involved in every wilderness designation bill passed by Congress. For 30 years, I have been involved in strategy meetings and public presentations about wilderness areas in nearly every state. During the past 15 years, I have given more than 200 lectures about wilderness at colleges in 35 states and Canadian provinces and afterwards discussed wilderness with small groups of students at local bars. I have stood with Earth First!ers, risking arrest and physical injury in nonviolent civil disobedience, to protect wilderness from bulldozers and chain saws. I have attended a dozen professional meetings on wilderness organized by federal and state agency wilderness managers, and I know key wilderness people in the agencies.

In my personal archives are three shelf-feet of congressional hearing records and committee reports on wilderness area designation; every Forest Service primitive area, Park Service and national wildlife refuge wilderness area recommendation document; every RARE II state document; every BLM wilderness study document for each of the Western states; the responses by conservation groups to all of these; and 23 file drawers of wilderness area issues dating back to the 1960s (this does not count a similar number of file drawers on other conservation issues). Believe it or not, I have read all of this stuff.

During 20 years as an editor, executive editor, or publisher of the *Earth First! Journal* (1980 to 1988) and *Wild Earth* (1990 to the present), I have read, rejected, accepted and edited more wilderness articles than I want to remember from all over North America and the world. I spent eight

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years researching my book (with Howie Wolke) on lower 48 roadless areas, *The Big Outside.*

During the past 15 years, I have been closely involved with the key conservation biologists working on protected area design and protection strategy. My wilderness work and close colleagues now reach into Mexico, Costa Rica, Canada, Chile, Argentina and southern Africa.

I have been personally involved in defending unprotected wilderness from dam building, water diversion, logging, road building, hard rock mining, oil and gas exploration and development, uranium mining, off-road vehicle abuse, poaching of reintroduced wolves, overgrazing, juniper chaining, observatory construction and introduction of exotic species. I have helped defend designated wilderness areas from dam building, overgrazing, grazing developments, administrative vehicle use, non-commercial logging, government predator killing, sabotage of endangered species recovery (Gila trout), mountain bike invasion and snowmobile invasion. We conservationists have not always been successful in this defense, and I know wild rivers now drowned behind dams, grand forests clearcut, stunning badlands stripmined....

In short, I know something about the only wilderness idea that matters on the ground—the one that has led thousands of people to devote their time, money and sometimes their freedom and even lives to protect wilderness from exploitation. This is the Wilderness Idea that has created the National Wilderness Preservation System of the United States of America.

This Real Wilderness Idea is very different from The Received Wilderness Idea invented and then lambasted by Baird Callicott, Bill Cronon and other deconstructionist social scientists. The literary and philosophical writings they draw from have had little influence in the wilderness protection movement; in fact, intellectual and academic discussions about wilderness have pretty much been ignored by wilderness defenders. Since 1920, wilderness conservationists have been motivated primarily by two things: One, they like a particular wilderness; two, they see a need to protect it from development and exploitation.

As Samuel Hays (1996), the great historian of resource conservation, Nature conservation and environmentalism, writes, "Cronon's wilderness is a world of abstracted ideas…but divorced from the values and ideas inherent in wilderness action."

This Received Wilderness Idea is a straw dog; it does not exist on the ground. It is not the idea of wilderness that led to the Wilderness Act and the National Wilderness Preservation System and spurred thousands of citizen conservationists from Alabama to Alaska. When one fights a phantom, it is easy to claim you have mortally wounded the monster.

Twenty-five hundred years ago, Socrates told Phaedrus, "I'm a man of learning and trees and open space teach me nothing, while men in towns do." More recently, Nobel Laureate Linus Pauling (1995) wrote,

> I remember reading a book on philosophy in which the author went on, page after page, on the question: If there is a leaf on a tree and you see that it is green in the springtime and red in fall, is that the same leaf or is it a different leaf? Is the essence of leafness still in it? Words, words, words, but 'chlorophyll' and 'xanthophyll'—which are sensible in this connection of what has happened to that leaf—just don't appear at all.

This so-called Received Wilderness Idea comes from Socrates and his buddies in town, not from the wilderness of trees and open country. And among all the words about the Received Wilderness Idea, words about living landscapes and the political reality that threatens them don't appear.

I have spent my life fighting the lies, blather and myths of extractive industry about wilderness. I have concluded that their pitiful arguments against wilderness are actually more legitimate, rational and grounded in reality than those of the postmodern deconstructionists.

I am not going to respond point by point to the academic left's complaints about wilderness. I've done it before, most recently in the Callicott/Nelson anthology, *The Great New Wilderness Debate,* and I have not noticed anyone rebutting my specific points (Foreman 1998). (I will, however, respond in detail in my book-in-progress, *The War on Nature.)* What I would like to do is present not the Received Wilderness Idea, but the Real Wilderness Idea of the citizen conservation movement and how it is still robust after all these years, blending both experiential and ecological values and purposes.

Self-Willed Land

In our slacker era, when rigor in thought and ethics is too much to ask for, we often get into a snarl because of poorly defined words. Bud Man on his motorized tricycle, academic grandees and just about everybody in between use the word *wilderness* in sloppy ways, muddying the wrangle about conservation.

In a 1983 talk at the Third World Wilderness Conference in Scotland, philosopher Jay Hansford Vest sought the meaning of wilderness in Old English and further back in Old Gothonic languages. He showed that wilderness means "'self-willed land'…with an emphasis on its own intrinsic volition." He interpreted *der* as *of the.* "Hence, in wil-derness, there is a 'will-of-the-land'; and in wildeor, there is 'will of the animal.' A wild animal is a 'self-willed animal'—an undomesticated animal; similarly, wildland is 'self-willed land.'" Vest shows that this willfulness is opposed to the "controlled and ordered environment which is characteristic of the notion of civilization." The early northern Europeans were not driven to lord over Nature; thus, wilderness "demonstrates a recognition of land in and for itself." (Vest 1985.) Thanks to Vest, we are able to understand that this word, wilderness, is not a coinage of modern civilization; it is a word brewed by pagan barbarians of the Bronze and Iron Ages.

This self-willed land meaning of wilderness overshadows all others. Wilderness means land beyond human control. Land beyond human control is a slap in the face to the arrogance of humanism—elitist or common man, capitalist or socialist, first worlder or third; for them, it is also something to be feared.

I've called wilderness areas the arena of evolution. However, Aldo Leopold, as usual, was way ahead of me. Fifty years ago, he saw wilderness as the "theater" for the "pageant of evolution." (Leopold 1989.) Evolution is self-willed. The land where evolution can occur is self-willed land, especially for large species.

The Wilderness Act

The civilized world's greatest embrace of self-willed land came in the form of the 1964 Wilderness Act in the United States. This legislation was the product of eight years of discussion and revision in Congress and in public hearings across the nation. It was pushed by hikers, horse packers, canoeists, hunters and fishers. It contains at least four definitions of wilderness. I believe that all four of these definitions are thoroughly in keeping with self-willed land. The first definition of wilderness is found in the statement of purpose for the Wilderness Act in Section 2(a):

> In order to assure that an increasing population, accompanied by expanding settlement and growing mechanization, does not occupy and modify all areas within the United States and its possessions, leaving no lands designated for preservation and protection in their natural condition, it is hereby declared to be the policy of the Congress to secure for the American people of present and future generations the benefits of an enduring resource of wilderness.

Was Congress, prodded by American citizens, setting up a National Wilderness Preservation System to preserve a mythical past wrapped up in literary romanticism, Manifest Destiny bravado and Calvinist dualism? Well…no. It was much simpler. Wilderness areas needed to be protected because all of the remaining backcountry of the United States was threatened with development and industrial exploitation driven by population growth, mechanization and expanding settlement. Here and throughout the wilderness conservation movement, the motive force has been to protect land from development. Hays (1996) writes, "[W]ilderness proposals are usually thought of not in terms of perpetuating some 'original' or 'pristine' condition but as efforts to 'save' wilderness areas from development." Wilderness areas, then, are lands protected from industrial civilization's conquest. Isn't that easy to understand?

The second definition is the ideal:

> 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 untrammeled by man, where man himself is a visitor who does not remain. Section 2(c).

Written by Howard Zahniser of The Wilderness Society, who, as a professional editor and writer, understood the importance of word selection, this definition agrees with self-willed land. First, wilderness is not where the works of man dominate the landscape. It is not under human will. Second, Zahniser chose the obscure word "untrammeled" carefully, and not just because it rolls off the tongue pleasantly. A *trammel* is a fish net and also a hobble for a horse, thus a thing that hinders free action. As a verb, *trammel* means to hinder the action of something. *Untrammeled,* then, means that the will of something is not hobbled; it is self-willed. Untrammeled land is the arena of evolution. Third, humans are only visitors in wilderness; there are no permanent human settlements. Many kinds of wilderness foes especially bristle at this barring of human habitation. However, I believe this lack of long-lasting settlement is key to wil-der-ness. Where humans dwell long, we trammel or hinder the willfulness of the land around our living sites and outward. How far? This hinges on the population size and technological sophistication of the group.

The third definition of wilderness immediately follows the second. It is the specific, practical definition of wilderness areas protected by the Wilderness Act and sets out the entry criteria for candidate areas:

> An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value. Section 2(c).

Although in keeping with self-willed land ("undeveloped," "primeval character and influence," "without permanent improvements or human habitation," "natural conditions"), this is a practical definition that acknowledges that even mostly self-willed land may not be pristine ("generally appears," "affected primarily," "substantially unnoticeable"). Indeed, the word *pristine* does not appear in the Wilderness Act.

This down-to-earth view of wilderness answers the often silly question, "What is natural?" It understands that *natural* is not a single point opposed to the single point of *unnatural*. Rather, I think it sees that land falls on a continuum from wholly yoked by human will to altogether self-willed. At some point, land quits being mostly dominated by humans; at some other point, land begins to be controlled primarily by the forces of Nature. There is a wide gray area in between, where human and natural forces both have some sway. After natural forces become dominant, the land is self-willed. Because we humans have limited and differing understandings of ecology and depths of wisdom, we may find the changeover to self-willed land in different places on this unnatural-natural line. But this does not mean we cannot say, "This place is primarily natural." And let us not fall into the woolly-headed trap of thinking that naturalness is merely a human idea. Naturalness exists out there. A falling tree in a forest does not need a human ear to be.

Ecological wounds suffered by the land come from humans trying to impose their will. The severity of these wounds and their full impact settle whether the land is mostly self-willed (affected primarily by the forces of Nature) or not. Some kinds of wilderness foes falsely believe that conservationists see wilderness as pristine (an absolute word). Other anticonservationists, in order to limit protection, argue that places must be pristine in order to qualify as wilderness areas. Neither gospel is true.

If we read Section 2(c) of the law closely, we see that there are really two definitions of wilderness twined about each other. One is a definition of the human experience in wilderness areas ("appears," "unnoticeable," "solitude," "a primitive and unconfined type of recreation," "educational," "historic," "scenic"). The other is an ecological definition ("undeveloped," "primeval character and influences," "forces of nature," "ecological," "scientific"). Understanding that these descriptions of ecological conditions and values are

prominent in the Wilderness Act belies the persistent rap that the act and the National Wilderness Preservation System created by it are only about scenery and recreation. Even some conservationists and scientists have criticized the Wilderness Act for an overwhelming recreational bias. It's important to understand that this is not the aim of the act, although federal agencies have often managed wilderness areas as if it were.

The two lessons we need to draw from Section 2(c) are that wilderness areas are not expected to be pristine and that the ecological values of wilderness areas are strongly recognized along with experiential values.

The fourth definition of wilderness comes with rules for managing land after it comes under the protection of the Wilderness Act:

> Except as specifically provided for in this Act, and subject to existing private rights, there shall be no commercial enterprise and no permanent road within any wilderness area designated by this Act and except as necessary to meet minimum requirements for the administration of the area for the purposes of this Act (including measures required in emergencies involving the health and safety of persons within the area), there shall be no temporary road, no use of motor vehicles, motorized equipment or motorboats, no landing of aircraft, no other form of mechanical transport, and no structure or installation within any such area. Section 4(c).

(Elsewhere, the Wilderness Act provides for certain exceptions to the above prohibitions, such as firefighting, rescue, livestock grazing and prospecting for minerals until 1984, all of which were political compromises that supporters of the Wilderness Act had to make before Western members of Congress would allow passage. Thus, the Wilderness Act is somewhat flawed and sometimes at odds with itself.)

The use prohibitions try to keep the land untrammeled (self-willed). They are more strict than the entry criteria in Section 2(c). For example, there is no requirement that candidate wilderness areas have to be roadless or unlogged, but Section 4(c) holds that they must be managed as roadless after they are placed in the National Wilderness Preservation System. In other words, existing roads must be closed and no further commercial logging allowed after designation of an area as wilderness. There are many cases of once-roaded or earlier-logged areas in the National Wilderness Preservation System—including some of the classic big wilderness areas in the West.

If what wilderness means and what the Wilderness Act says are clearly worded, many misunderstandings about wilderness should melt away. However, as we too often find, muddying the meaning of wilderness is not always due to simple ignorance, but is a witting tactic by anticonservationists.

The brawl over conservation is at heart about whether we can abide self-willed land.

The River Wild

In "Rewilding and Biodiversity: Complementary Goals for Continental Conservation," Michael Soulé and Reed Noss (1998) clearly show that science-based Nature-reserve design does not come to bury traditional wilderness area designation, but to marry it. To see how this is so, we need both a lookout that takes in the whole conservation movement and a metaphor that can limn it.

The metaphor I use for the conservation movement is that of a river's watershed, with streams dropping from high saddles and cirques and flowing down to mix as currents in the river. A good perspective is that of an eagle, which allows us to see the watershed spread out before us.

The headwater streams that flow together to make the River Wild are wildlife protection, stewardship, beauty protection and forest protection. Downriver, the streams of wilderness protection, ecosystem representation, carnivore protection, connectivity, and rewilding flow in. Nearby, but apart, are watersheds for the rivers of resourcism and environmentalism. I see environmentalism (pollution fighting), conservation (wildlife and wildlands protection) and resourcism (efficient exploitation of resources) as separate movements, with different views about humans and Nature. Some of the headwaters of the Resourcism River come off the same ridges and peaks as those that feed the River Wild, but they flow in a different direction. The Environmentalism River does not spring from the same divides as the River Wild, but its course later runs parallel to the River Wild, with only a low ridge between the two.

All the streams feeding into the conservation movement spring from protecting land and wildlife from threats of development and exploitation.

From the farthest mountain pass flows the sturdy stream of Wildlife Protection. Contrary to the common wisdom, American conservation began with wildlife protection, not with forest protection. English aristocrat William Henry Herbert came to America in 1831 and brought with him the "code of the sportsman." In his woodsy role as "Frank Forester," Herbert fought the era's rapacious market hunting and spurred sportsmen to band together to fight game hogs. National hunting magazines began in the 1870s, and they joined the battle against commercial exploitation of game and fish and for habitat protection. Sport hunters and their magazines raised a din against the senseless slaughter of the buffalo. The first national conservation group was not the Sierra Club (founded in 1892), but the Boone and Crockett Club, founded in 1887 by Theodore Roosevelt and his fellow hunters. The role of Boone and Crockett in creating the first national parks, wildlife refuges and forest reserves has generally been overlooked by historians as well as by today's conservationists (Reiger 1990).

The second headwater stream is that of Stewardship. One of the most remarkable Americans of the 19th century was Vermont's George Perkins Marsh. As Lincoln's ambassador to Turkey and later Italy, Marsh took in the sights of the Mediterranean, where among the ruins of classical civilizations he found ruins of the land. The rocky, treeless hills of Greece were as much a testament to a fallen civilization as the crumbling Acropolis. His 1864 book, *Man and Nature; or, Physical Geography as Modified by Human Action,* is one of the benchmarks of both history and science. He wrote, "But man is everywhere a disturbing agent. Wherever he plants his foot, the harmonies of nature are turned to discord." Former *New York Times* foreign correspondent and later environmental reporter Phillip Shabecoff (1993) writes, "Marsh was the first to demonstrate that the cumulative impact of human activity was not negligible and, far from benign, could wreak widespread, permanent destruction on the face of the earth." However, I also see a spring called Malthus contributing to the flow in the Stewardship Creek.

Stewardship is needed to combat soil erosion and other careless land management; more recently, it has tried to deal with the threats of human population growth and depletion of resources.

The third headwater stream is Beauty—protection of national parks and other places to safeguard their spectacular, inspiring scenery. Yosemite Valley in the Sierra Nevada of California was not discovered by white settlers until 1851, and the mighty sequoias near it were not described until 1852. Within a few years, both were attracting visitors who wanted to see their splendor. In 1859, Horace Greeley, editor of the *New York Tribune,* visited the Yosemite Valley and wrote to his readers that it was "the most unique and majestic of nature's marvels." (Runte 1987.) Five years later, on June 30, 1864, taking time from the burden of the Civil War, President Abraham Lincoln signed a bill transferring beautiful Yosemite Valley and the Mariposa Grove of sequoias to the state of California as a public park.

American citizens supported setting aside Yellowstone, Yosemite and the other early national parks primarily because of beauty, although other factors, including the support of railroads, helped lead to the political decisions. Conservationists feared that all of America's natural wonders were threatened by tawdry tourist development and industrial exploitation because of what had happened to Niagara Falls from 1830 on. Alfred Runte (1987) writes, "In the fate of Niagara Falls, Americans found a compelling reason to give preservation more than a passing thought.…A continuous parade of European visitors and commentators embarrassed the nation by condemning the commercialization of Niagara." This all holds true for the closely related national parks movement in Canada.

The fourth and final headwater stream is Forest Protection. It falls out of a cirque-held tarn, but cascades only briefly before a great sharp ridge splits the stream. One side pours off into the Resourcism River with Gifford Pinchot and the other falls into the River Wild with John Muir. In the 1880s, business interests in New York City called for protecting the Adirondacks to ensure a good water supply from the headwaters of the Hudson River. In the West, irrigators and towns worried about watershed destruction by overgrazing and logging in the high country and asked for protection. Forest lovers, led by John Muir, feared that all natural forests would soon be scalped by logging companies. New York protected state lands in the Adirondacks, and Congress authorized the President to withdraw forested lands in the West.

The 1891 Forest Reserve Act "merely established reserves; it did not provide for their management," explains Samuel Hays (1979). Conservationists ranging from Muir to the sportsmen of the Boone and Crockett Club hoped to keep the forest reserves off-limits to commercial logging, grazing and other uses. They wanted the reserves protected for their watershed, recreational and scenic values, as well as for wildlife habitat. Gifford Pinchot, however, demanded "management" that would include logging, grazing and dam building. The 1897 Organic Act, which Pinchot pushed, opened the reserves for commercial exploitation. However, for both Muir and Pinchot, forest protection was a response to the threat of uncontrolled and wasteful logging.

Down the River Wild another stream—Wilderness—comes in. The specific movement to preserve wilderness areas came first from Forest Service rangers, such as Art Carhart and Aldo Leopold. Leopold, who railed against "Ford dust" in the backcountry, feared that growing automobile access to the national forests would destroy and replace the pioneer skills of early foresters. He wanted to protect the experience he enjoyed when he came to Arizona's Apache National Forest in 1909. "Wilderness areas are first of all a series of sanctuaries for the primitive arts of wilderness travel, especially canoeing and packing," said Leopold (1987). In 1921, he defined wilderness as "a continuous stretch of country preserved in its natural state, open to lawful hunting and fishing, big enough to absorb a two weeks' pack trip, and kept devoid of roads, artificial trails, cottages, or other works of man." (Leopold 1921.) The backcountry was threatened by automobiles and roads. It needed protection. In the 1930s, conservationists like Bob Marshall called for wilderness protection in the national parks because the parks were threatened by proposals for scenic highways from the National Park Service and the tourist industry.

On the other side of the River Wild, just below the confluence with the Wilderness stream, the Ecological Representation stream joins in. As early as 1926, the *Naturalist's Guide to the Americas,* edited by prominent biologist Victor Shelford, called for protecting ecologically representative natural areas. Both the National Audubon Society and The Nature Conservancy have tried to buy and protect ecosystems not represented in federal and state protected areas. The National Park Service and conservationists have tried to establish national parks for all major ecosystems, admittedly without total success. The 1975 Eastern Wilderness Areas Act, which established wilderness areas on national forests east of the Rockies, was explicitly about ecosystem representation. During RARE II, the Forest Service, with conservationist support, sought to establish new wilderness areas that would protect hitherto unprotected ecosystems. The push here came because of development threats. Ecosystem representation, however, has not gotten the heed it needs. In a special report for the Department of the Interior, Reed Noss and his co-authors (1995) have detailed our poor record in protecting representative ecosystems.

Soon after, the Predator Protection stream splashes down as a stunning waterfall. In "A Nature Sanctuary Plan" unanimously adopted by the Ecological Society of America on December 28, 1932, Victor Shelford wrote, "Biologists are beginning to realize that it is dangerous to tamper with nature by introducing plants or animals, or by destroying predatory animals or by pampering herbivores.…" The Ecological Society said we needed to protect whole assemblages of native species, including large carnivores, and the natural fluctuations in numbers of species (Shelford 1933). At that time, protecting wolves and mountain lions was—well, bold, hence my seeing it as a waterfall. Large carnivores were clearly threatened with extirpation from the United States, including from the national parks.

Another conservation stream began in the 1960s with work by E. O. Wilson and Robert MacArthur on island biogeography. Closely tied to island biogeography is the *species-area relationship.* Michael Soulé (1995) writes, "One of the principles of modern ecology is that the number of species that an area can support is directly proportional to its size. A corollary is that if area is reduced, the number of species shrinks." The species-area relationship has been shown

with birds, mammals, reptiles and other kinds of animals on the Greater Sunda Islands (the Indonesian archipelago), Caribbean islands and elsewhere. An ecological rule of thumb is that if a habitat is reduced 90 percent, it will lose 50 percent of its species.

In 1985, University of Michigan ecologist William Newmark looked at a map of the western United States and Canada and realized that our national parks were islands. As the sea of settlement and logging swept over North America, national parks became islands of ecological integrity surrounded by human-dominated lands. Did island biogeography apply?

Newmark found that the smaller the national park and the more isolated it was from other wildlands, the more species it had lost. The first species to go had been the large, wide-ranging critters—such as lynx and wolverine. Loss of species (*relaxation* in ecological lingo) had occurred *and was still occurring*. Newmark (1987) predicted that all national parks would continue to lose species (as Soulé had previously predicted for East African reserves). "Without active intervention by park managers, it is quite likely that a loss of mammalian species will continue as western North American parks become increasingly insularized." Even Yellowstone National Park isn't big enough to maintain viable populations of all the large wide-ranging mammals. Only the total area of the connected complex of national parks in the Canadian Rockies is substantial enough to ensure their survival.

Bruce Wilcox and Dennis Murphy (1985) wrote that "habitat fragmentation is the most serious threat to biological diversity and is the primary cause of the present extinction crisis." Reed Noss, then at the University of Florida, acted on their warning by designing a conceptual Nature reserve system for Florida consisting of core reserves surrounded by buffer zones and linked by habitat corridors. In a paper presented to the 1986 Natural Areas Conference, Noss (1987) said, "The problems of habitat isolation that arise from fragmentation can be mitigated by connecting natural areas by corridors or zones of suitable habitat."

This connectivity stream came into being because of fragmentation threats by dams, highways, clearcutting and other development.

Those of us who float rivers know that it can take a long time before the water from an incoming stream mixes fully with the main current. We see this when a creek full of glacial milk dumps into the gin-clear waters of a river in the Yukon. A similar scene occurs in the Southwest when a clear mountain stream plunges into a red river full of silt. For miles, there may be two currents shown by their distinct tints.

So it has been with our river. The wildlife protection, stewardship, beauty, forest protection and wilderness streams mixed fairly well, but the currents of ecosystem representation, predator protection and connectivity did not mix as well.

Now a new stream—Rewilding—has entered. Unlike the other currents, this rewilding stream mixes all the other currents together into a deep, wide, powerful river.

Soulé and Noss (1998) "recognize three independent features that characterize contemporary rewilding:

- Large, strictly protected core reserves (the wild)
- Connectivity
- Keystone species."

In shorthand, these are "the three C's: Cores, Corridors, and Carnivores."

This rewilding approach is built on recent scholarship showing that ecosystem integrity often depends on the functional presence of large carnivores. Michael Soulé and his graduate students (1988) have shown that native songbirds survive in large suburban San Diego canyons where there are coyotes; they disappear faster when coyotes disappear. Coyotes eat foxes and prowling house cats. Foxes and cats eat quail, cactus wrens, thrashers and their nestlings.

In the East, David Wilcove, staff ecologist for the Environmental Defense Fund, has found that songbirds are victims of the extirpation of wolves and cougars. As we have seen, the population decline of songbirds as a result of forest fragmentation is well documented, but Wilcove (1986) has shown that songbird declines are partly due to the absence of large carnivores in the East. Cougars and gray wolves don't eat warblers or their eggs, but raccoons, foxes, skunks and possums do, and the cougars and wolves eat these midsize predators. When the big guys were hunted out, the populations of the middling guys exploded—with dire results for the birds. Soulé calls this phenomenon—mid-sized predators multiplying in the absence of large predators—*mesopredator release.*

John Terborgh of Duke University (in my mind the dean of tropical ecology) is currently studying the ecological effects of eliminating jaguars, pumas and harpy eagles from tropical forests. He tells us that large carnivores are major regulators of prey species numbers—the opposite of once-upon-a-time ecological orthodoxy. He has also found that the removal or population decline of large carnivores can alter plant species composition, particularly the balance between large- and small-seeded plants, due to increased seed and seedling predation by superabundant herbivores that are normally regulated by large carnivores. This is called *top-down regulation* (Soulé and Noss 1998). There is compelling evidence for such top-down regulation in forests outside the tropics as well.

Rewilding is "the scientific argument for restoring big wilderness based on the regulatory roles of large predators," according to Soulé and Noss.

> Three major scientific arguments constitute the rewilding argument and justify the emphasis on large predators. First, the structure, resilience, and diversity of ecosystems is often maintained by 'top-down' ecological (trophic) interactions that are initiated by top predators (Terborgh 1988, Terborgh et al. 1999). Second, wide-ranging predators usually require large cores of protected landscape for foraging, seasonal movements, and other needs; they justify bigness. Third, connectivity is also required because core reserves are typically not large enough in most regions; they must be linked to insure long-term viability of wide-ranging species....In short, the rewilding argument posits that large predators are often instrumental in maintaining the integrity of ecosystems. In turn, the large predators require extensive space and connectivity (Soulé and Noss 1998).

If large native carnivores have been extirpated from a region, their reintroduction and recovery is central to a conservation strategy. Wolves, grizzlies, cougars, lynx, wolverines, black bears, jaguars and other top carnivores need

to be restored throughout North America in their natural ranges.

Although Soulé and Noss (1998) state, "Our principal premise is that rewilding is a critical step in restoring self-regulating land communities," they claim two nonscientific justifications: (1) "the ethical issue of human responsibility," and (2) "the subjective, emotional essence of 'the wild' or wilderness. Wilderness is hardly 'wild' where top carnivores, such as cougars, jaguars, wolves, wolverines, grizzlies, or black bears have been extirpated. Without these components, nature seems somehow incomplete, truncated, overly tame. Human opportunities to attain humility are reduced."

What Soulé and Noss have done here is of landmark importance for the wilderness conservation movement as well as for those primarily concerned with protecting biological diversity. They have developed the *scientific basis* for the need for big wilderness area complexes. Here, science buttresses the wants and values of wilderness recreationists. Big wilderness areas are not only necessary for inspiration and a true wilderness experience, but they are absolutely necessary for the protection and restoration of ecological integrity, native species diversity and evolution. Elsewhere, Soulé calls wilderness areas self-regulated, another way of saying self-willed or untrammeled.

Metaphors are never perfect, but this view of conservation as the watershed of the River Wild, with different side streams adding power, diversity and nutrients, is pretty darn good. It allows us to see that new streams did not replace old streams. It recognizes that the headwater streams that initially formed the River Wild did not disappear when new streams flowed in. It shows the compatibility of the "scientific" streams with the aesthetic and recreational streams. And it proves that the threat of destruction drove all of these conservation currents.

Wilderness and biodiversity conservation are not airy-fairy flights of romantic fantasy to recapture a mythical past of purity and goodness, but real-world efforts to protect self-willed land from damage by increasing population, expanding settlement and growing mechanization.

(Portions of this essay are excerpted from *The War on Nature,* a book-in-progress by Dave Foreman.)

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