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Wilderness Imperatives and Untrammeled Nature

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Sandra Zellmer[1]

INTRODUCTION

Wilderness is often considered the epitome of naturalness – what nature ought to be. Indeed, in many ways, society, through its environmental laws, has prioritized the protection of wilderness over other areas of nature and other aspects of naturalness. We give our wilderness areas iconic names, like Delirium, Desolation, Devil's Backbone, River of No Return, and Superstition, and we idealize them and treat them as something utterly unique and apart from our technology-ridden daily lives.

The nation's preeminent wilderness statute, the Wilderness Act of 1964, is credited with significant preservation achievements. Over the years, the Act has remained remarkably robust, with few legislative revisions. The Act is so well loved that, as Professor Rodgers notes, it is "virtually repeal-proof."[2] During almost every congressional session since 1964, new wilderness areas have been added to the system or existing areas have been expanded.

But are wilderness areas really *natural*? And if they are something *other* than natural, does that diminish their value to society and to environmental law? As we grapple with these questions, a related issue comes to mind. By prioritizing "fenced-off" remote wilderness areas through stringent legal restrictions, are we unintentionally diminishing the idea of nature and short-changing a more holistic relationship between humans and nature, wherever we might encounter it? Historian William Cronon argues that the "mythic meanings attached to wilderness" – and the perception that humans

[1] Portions of this chapter are derived from Sandra Zellmer, *Water, Wilderness, and Climate Change*, 42 Envtl. L. 313 (2012).

[2] William H, Rodgers, Jr., *The Seven Statutory Wonders of U.S. Environmental Law: Origins and Morphology*, 27 Loy. L.A. L. Rev. 1009, 1013 (1994).

are apart from nature – "prevent realization of [other] important environmental values."[3] If this is true, must the "wooly-headed, tree-hugging worldview . . . which has long idealized wilderness (as *true nature*) while simultaneously designating humanity as the scourge of the planet, 'die so that something new can live,'" as Ted Nordhaus and Michael Shellenberger posited in *The Death of Environmentalism*?[4]

This chapter addresses these questions by tracing the origins and purposes of the Wilderness Act and by examining the Act's role within the constellation of federal environmental laws and its continuing impact on society and on individual well-being. It argues that, contrary to the views of Cronon, Nordhaus, and Shellenberger, idealizing wilderness does not diminish our relationship with nature; rather, it enriches it just as much if not more than it did in 1964.

Admittedly, much has changed since 1964. We now have a more sophisticated scientific understanding of complex, dynamic ecological processes, which arguably undercuts the Act's overarching equilibrium-dominated theme. We also face unparalleled pressures wrought by climate change, which arguably calls for adaptive management interventions to maintain or restore disrupted ecological communities in hopes of keeping protected areas as natural as possible. But instead of preventing the realization of other important values related to nature, many of which are explored in this book, the wilderness construct provides a symbolic, spiritual, and ecological touchstone for some of our deepest feelings about natural areas – solitude, peace, quiet, and freedom from mechanized and motorized technologies that otherwise surround us and saturate our society and our environment.

WILDERNESS AND NATURALNESS

On September 3, 1964, the date that the Wilderness Act was signed into law, a nation still reeling from the assassination of President Kennedy and alarmed by Rachel Carson's report of environmental calamity, embraced the lofty

[3] Gregory H. Aplet & David N. Cole, *The Trouble with Naturalness: Rethinking Park and Wilderness Goals* 12, 25–26, *in* Beyond Naturalness: Rethinking Park and Wilderness Stewardship in an Era of Rapid Change 1–11 (Cole & Yung eds. 2010) (quoting William Cronon, The Trouble with Wilderness: Or Getting Back to the Wrong Nature [1995]).

[4] Keith Floor, *The Great Schism in the Environmental Movement* (Dec. 12, 2012), http://www.slate.com/articles/health_and_science/science/2012/12/modern_green_movement_eco_pragmatists_are_challenging_traditional_environmentalists.single.html (quoting *Death of Environmentalism: Global Warming Politics in a Post-Environmental World* (2004), *at* http://www.thebreakthrough.org/images/Death_of_Environmentalism.pdf).

preservationist goals of the Act as an expression of something uplifting, virtuous, and uniquely American.[5] Enacted just two months after the Civil Rights Act of 1964,[6] the Wilderness Act reflects common spiritual and humanist themes. In particular, four distinctively spiritual objectives emerged during the congressional hearings: protecting pristine lands as created by God; recognizing and preserving remote, quiet places to encounter God; providing space for spiritual renewal; and protecting wild areas as places of escape from the distractions and temptations of the modern world. In his work on *The Spiritual Values of Wilderness*, Professor John Nagle identified a fifth value in theological scholarship: wilderness as a place for the spiritual testing of a person's character and strength.[7]

The Wilderness Act encapsulates these themes by protecting certain federal lands retaining a "primeval character and influence." For an area to be designated as wilderness under the Act, it must meet the following criteria:

> (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.[8]

Since 1964, Congress has designated wilderness areas within every major category of the federal public lands: national forests, national parks, wildlife refuges, and public lands managed by the Bureau of Land Management (BLM). There are more than 700 federally designated wilderness areas in forty-four states, covering more than 107 million acres of land, or around 5 percent of the United States land base. In the lower forty-eight states, about 75 percent is located within only five ecoregions: one desert ecoregion – the Mojave Desert of California – and four high-elevation ecoregions – the southern and middle Rocky Mountains, the Sierra Nevada Mountains, and the Cascade Mountains of the Pacific Northwest.

Wilderness designations include immense swaths of land, such as Wrangell-St. Elias in Alaska, which contains more than 9 million acres, and the Frank Church-River of No Return Wilderness in the Rockies, with more than

[5] Robert L. Glicksman & George Cameron Coggins, *Wilderness in Context*, 76 DENV. U. L. REV. 383, 385–86 (1999).

[6] Civil Rights Act of 1964, Pub. L. No. 88–352, 78 Stat. 241 (enacted July 2, 1964) (codified in various sections of Title 42 of the U.S. Code).

[7] John Nagle, *The Spiritual Values of Wilderness*, 35 ENVTL. L. 955, 960 (2005).

[8] Wilderness Act, 16 U.S.C. § 1131(c) (2006).

2 million acres. But small areas amenable to "preservation and use in unimpaired condition" are also included in the system. For example, the Rocks and Islands Wilderness in California encompasses nineteen acres of coastal shoreline, reefs, and islands situated within the Pacific flyway, and Pelican Island Wilderness covers a scant six acres of lagoon within the Indian River in Florida, initially set aside as a bird haven by President Theodore Roosevelt in 1903.

Once designated, land managers are directed to protect and manage wilderness areas "so as to preserve . . . *natural* conditions."[9] However, neither "natural" nor "wild" is defined in the Act. It may well be that the sponsors of the Wilderness Act thought that the two terms were synonymous, and in 1964 scientists who believed in the equilibrium theory of nature might have agreed – if we just let it be wild and unmanipulated, it will be natural.

In today's common vernacular, "natural" is understood as "existing in or produced by nature," as opposed to artificial or human made.[10] People tend to identify naturalness with landscapes that function and look like they did at some point in history before human disturbance. Thus, some notion of "historical fidelity" often goes hand in hand with the idea of naturalness. As Aplet and Cole suggest, "[n]aturalness could be measured as the degree to which a place retains the ecological composition and structure – dynamic yet bounded over time – that characterized the system before the dramatic anthropogenic modifications of the recent past."[11] Likewise, scientists may perceive an area as natural if its composition, structure, and ecological processes reflect conditions that would have prevailed in the absence of modern, technological humans.[12] Such areas are generally unaffected by pollution, have intact assemblages of wildlife and plant species, and are not altered by infrastructure, such as roads, dams, towers, pipelines, or buildings.

"Wild" – free, untamed, and autonomous – is a related concept, but it is not synonymous. The principal author of the Wilderness Act, Howard Zahniser, defined the term as "untrammeled" – "not being subjected to human controls and manipulations that hamper the free play of natural forces."[13] He contrasted wilderness areas with parks and felt a desperate need to protect at least some federal landholdings from recreational motorists and the tendency

[9] 16 U.S.C. § 1133(c) (2006).

[10] Webster's Third New International Dictionary 1506–07 (Philip Babcock Gove ed., 2002).

[11] Aplet & Cole, *supra* note 3, at 19–20.

[12] *Id.* at 13.

[13] Doug Scott, The Enduring Wilderness 2 (2004) (quoting letter from Howard Zahniser to C. Edwards Graves [Apr. 25, 1959]).

"to barber and manicure wild America."[14] Zahniser and other drafters and sponsors of the Act were at least as interested – if not more – in minimizing human intervention in wilderness areas as in maintaining high-quality ecological conditions.[15]

When Congress decided to embrace Zahniser's ideas by passing the Act in 1964, it was not writing on a blank slate. The first official wilderness-like reserve in the National Forest System was established in 1924, with the adoption of assistant forester Aldo Leopold's proposal to set aside an area within the Gila National Forest. Leopold knew that his proposal would be "rank heresy to some minds," because Forest Service lands were used extensively for timber harvesting and grazing. However, Leopold believed that wilderness preservation provided important low-impact recreational opportunities that could be reconciled with existing utilitarian goals.[16] At around the same time, portions of the Superior National Forest, now known as the Boundary Waters Canoe Area Wilderness, were given administrative protection, and road building was prohibited in the White River National Forest to preserve the primeval "mood" of Trappers Lake basin.[17] U.S. Forest Service Regulation L-20, issued in 1929, provided formal guidance for establishing and managing primitive areas. It established broad guidelines to maintain natural conditions "for purposes of public education and recreation," leaving the details for individual area plans.[18] During the 1930s, wilderness policies were strengthened under the leadership of Bob Marshall, head of the Forest Service Division of Recreation and Lands.[19] Regulation L-20 was replaced with the "U Regulations," which provided for classification of undeveloped areas as wilderness, wild, or primitive and prohibited roads, motorized vehicles, and logging in wilderness and wild areas.[20] The prohibition against motorized vehicles was subsequently extended to primitive areas, and the U Regulations became the basis for the Wilderness Act of 1964.

[14] Aplet & Cole, *supra* note 3, at 17.

[15] Paul S. Sutter, Driven Wild: How the Fight Against Automobiles Launched the Modern Wilderness Movement 14 (2002); Daniel N. Cole, *Paradox of the Primeval: Ecological Restoration in Wilderness*, 18 Eco. Restoration 77–86 (2000).

[16] Aldo Leopold, *The Wilderness and Its Place in Forest Recreational Policy*, 19 J. Forestry 718, 719 (1921).

[17] Michael McCloskey, *The Wilderness Act of 1964: Its Background and Meaning*, 45 Or. L. Rev. 288, 296–97 (1966).

[18] Charles F. Wilkinson and H. Michael Anderson, Land and Resource Planning in the National Forests 338–39 (1998).

[19] *Id*. at 340.

[20] 36 C.F.R. § 216.20 (1939). *See McMichael v. United States*, 355 F.2d 283, 286 (9th Cir. 1965) (upholding conviction for operating motorized vehicle in primitive area in violation of U Regulations, 36 C.F.R. § 251.21(a) (1963)).

Thus, recreation, forestry, vehicles, and roads were foremost in the sponsors' minds. Perhaps this provides another reason why, instead of including a specific definition of either "wild" or "natural" in the Wilderness Act, Congress prohibited certain *activities* that it believed would detract from the untrammeled naturalness of wilderness areas. Specifically, the Act forbids all permanent and most temporary roads, as well as all commercial activities. It also restricts motor vehicles, motorized equipment, mechanical transport, aircraft landings, structures, and installations.[21] Despite these directives, land management agencies and courts alike have struggled to meet the challenges of keeping wilderness areas free of deliberate human intervention and disturbance (wild) while maintaining and restoring ecological processes and communities (natural). On occasion, they have discovered that not only are the terms "wild" and "natural" not synonymous, they can be downright contradictory.

IMPLEMENTING THE WILDERNESS ACT'S TERMS

To preserve the wild, untrammeled characteristics of designated wilderness areas, the Wilderness Act imposes some of the most restrictive management constraints found in federal law. Although the Act's prohibitions against roads, motors, and other activities sweep broadly, the Act recognizes several categories of exceptions. Two are most relevant to understanding the Act's constraints on wilderness management. First, Section 4(c) of the Act provides that agencies may allow motor vehicles, motorized equipment, mechanical transport, aircraft landings, structures, and installations "as necessary to meet minimum requirements for the administration of the area."[22] In addition, Section 4(d) authorizes "such measures ... as may be necessary in the control of fire, insects, and diseases."[23]

Courts have generally construed the first of these two exceptions narrowly.[24] Section 4(c) was at the heart of a landmark case in the Kofa Wilderness in the Sonoran Desert of southwest Arizona. The Kofa Wilderness was designated by Congress in 1990. It makes up 80 percent of the Kofa Wildlife Refuge, which was created by an executive order in 1939. The executive order explicitly declared that the Refuge was being set aside for "conservation and

[21] 16 U.S.C. § 1133(c).
[22] *Id.*
[23] *Id.* § 1133(d)(1).
[24] *See* Peter A. Appel, *Wilderness and the Courts*, 29 STAN. ENVTL. L.J. 62 (2010), and *Wilderness, the Courts, and the Effect of Politics on Judicial Decisionmaking*, 35 HARV. ENVTL. L. REV. 275 (2011) (finding that courts are more likely to uphold wilderness-protective decisions than they are wilderness-impacting decisions).

development of natural wildlife resources," in particular, desert bighorn sheep.[25] During a period of extended drought, the U.S. Fish and Wildlife Service (FWS) and the Arizona Game and Fish Department decided to build two permanent tanks in the wilderness to augment water supplies for bighorn sheep. Wilderness Watch successfully sued, claiming that, while the facilities might be useful to the conservation of sheep threatened by drought, they were unnecessary "installations."

The Ninth Circuit Court of Appeals enjoined the construction and maintenance of the water tanks. The court found that, although sheep conservation was undoubtedly a legitimate purpose within the wilderness area, the tanks were undoubtedly installations that unlawfully trammeled the wilderness, contrary to the explicit terms of the Act. Even if such installations might be useful to sheep threatened by drought and high temperatures, the FWS had failed to establish that they were a necessary minimum requirement for wilderness administration.[26] In effect, the court's construction of the Act elevated the wild over the needs of natural, endemic species.

In *Californians for Alternatives to Toxics v. U.S. Fish and Wildlife Service*, a federal district court required the protection of *both* the wild and the natural by rejecting the Forest Service's argument that the application of rotenone, a deadly chemical, was a necessary step toward the recovery of the native Paiute Cutthroat Trout.[27] It held that the agency had neglected the well-being of other endemic species in the Carson-Iceburg Wilderness, and found that the use of motorized or mechanized equipment to apply the chemical was not necessary to preserve wilderness character.[28]

Similarly, in a case involving the Emigrant Wilderness of northern California, the Forest Service planned to repair several small, stone dams, constructed prior to wilderness designation in the early twentieth century, to preserve their historical values and to enhance fisheries by augmenting downstream flows. The court found that the dams violated the prohibition on any "structure or installation" and that the proposal was not necessary to meet the minimum requirements for the administration of the area and, thus, was not permitted under the Wilderness Act.[29] The court noted, "[w]hat would be lost is some enhancement to a particular use of the area (fishing), but that use, while perhaps popular, is not an integral part of the wilderness nature of that

[25] *Wilderness Watch, Inc. v. U.S. Fish and Wildlife Service*, 629 F.3d 1024, 1033–34 (9th Cir. 2010) (citing Exec. Order No. 8039, 4 Fed. Reg. 438 (1939)).

[26] *Id.* (citing 16 U.S.C. § 1133(c)).

[27] 814 F. Supp. 2d 992 (E.D. Cal. 2011).

[28] *Id.* at 1022.

[29] *High Sierra Hikers Ass'n v. U.S. Forest Serv.*, 436 F. Supp. 2d 1117 (E.D. Cal. 2006) (citing 33 U.S.C. § 1133(c)).

area."[30] The legal issue was relatively straightforward given the unambiguous language of the Wilderness Act. However, the court also had to decide what to do with the pre-existing dams. To require them to be dismantled would entail extensive human intervention, but leaving them intact would "trammel" the wilderness. The court ultimately left them to decay under the natural forces of weather and time.[31]

Conversely, in *Wolf Recovery Foundation v. Forest Service*, a federal district court in Idaho upheld a decision to authorize the use of intrusive monitoring techniques – helicopters – to inventory and monitor reintroduced wolves and their offspring in the Frank Church-River of No Return Wilderness.[32] The court upheld the Forest Service's special-use permit that allowed Idaho Fish and Game to use low-flying helicopters to track, pursue, dart, and collar wolves. Although the Wilderness Act generally precludes helicopters, the court deemed the permit "necessary" because it would improve the understanding "of the character of the wilderness prior to man's intervention" and "the predator/prey relationship that existed in the past."[33] The court added, "[t]his proposed activity is designed to aid the restoration of a specific aspect of the wilderness character of the Frank Church Wilderness that had earlier been destroyed by man."[34] The plaintiffs suspected that the primary reason for monitoring was to aid a wolf-hunting program initiated by Idaho.[35] Although the court did not reach this issue, it did recognize the wild/natural paradox posed by the monitoring program:

> Helicopters carry "man and his works" and so are antithetical to a wilderness experience. It would be a rare case where machinery as intrusive as a helicopter could pass the test of being "necessary to meet minimum requirements for the administration of the area." However, this case may present that most rare of circumstances. Here, the helicopters are used to collect data on wolves. The wolves were released in the Wilderness to restore the area's wilderness character . . .. [Thus,] the helicopter can be necessary to restoring the wilderness character of the area.[36]

[30] *Id*. at 1137.

[31] Dave H. Johnson, *The Battle Over Fish Check Dams in the Emigrant Wilderness* (Mar. 29, 2010), http://ezinearticles.com/?The-Battle-Over-Fish-Check-Dams-in-the-Emigrant-Wilderness&id= 4018575.

[32] *Wolf Recovery Fnd. v. U.S. Forest Serv*., 692 F. Supp. 2d 1264 (D. Id. 2010).

[33] *Id*. at 1268.

[34] *Id*.

[35] *Conservation Groups Challenge Wolf Hunting* (Aug. 21, 2009), http://www.defenders.org/press-release/conservation-groups-challenge-wolf-hunting; *Wolf Hunting and Trapping Seasons* (2011–2012), http://fishandgame.idaho.gov/public/hunt/?getPage=121#2012.

[36] *Wolf Recovery*, 692 F. Supp. 2d at 1268–69.

The court added a cautionary note, stating that its decision did not represent a "stamp of approval" on helicopters in wilderness, but was strictly limited to its facts: "*This proposed activity is designed to aid the restoration of a specific aspect of the wilderness character that had earlier been destroyed by man*. The use of helicopters for any other purpose would be extremely difficult to justify . . ."[37]

An experiment in a Virginia wilderness area demonstrates just how far the "necessary minimum requirements" exception might be pushed by land managers eager to sacrifice "wildness" for "naturalness." To diminish acidity caused by air pollution and restore fish populations adversely affected by high acidity, Forest Service managers used helicopters to dump 140 tons of limestone into streams within the St. Mary's Wilderness. The agency recognized that "[t]he question is whether to allow continued loss of the aquatic biota while preserving the wilderness concept or ideal of 'untrammeled,' or compromise the wilderness ideal, to preserve the aquatic resource."[38] The intervention worked – albeit briefly – to enhance the wilderness area's "outstanding aquatic resource." Within a few months, stream pH had returned to desirable levels and macro-invertebrate and fish populations began to improve. Within six years, however, the streams were once again experiencing high acidity and the limestone treatment was repeated.[39] The Virginia experience shows just how difficult it can be to stop so-called "necessary" interventions once they have been initiated.

The second exception for otherwise nonconforming activities in wilderness areas (Section 4(d)) authorizes "such measures . . . as may be necessary in the control of fire, insects, and diseases."[40] The term "necessary" should be construed the same as it is for the "necessary to meet minimum requirements" exception of Section 4(c) described above.[41] The cases, however, are mixed. In *Sierra Club v. Lyng I*, the first of two related cases, the district court remanded a beetle eradication proposal involving extensive chemical spraying and harvesting thousands of acres of trees by chainsaw, "accompanied by noise and personnel in a continuing process unlimited in scope."[42] It found that the Sierra Club had "amply demonstrated" that the proposal was "wholly antithetical to the wilderness policy established by Congress."[43] Despite the threat

[37] *Id*. (emphasis supplied).
[38] U.S. Department of Agriculture Forest Service R8, Decision Notice and Finding of No Significant Impact: Proposed St. Mary's Aquatic Restoration Project (1998), at www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev3_000366.pdf.
[39] Cole & Yung, *supra* note 3, at 2010.
[40] 16 U.S.C. § 1133(d)(1).
[41] *See Powerex Corp. v. Reliant Energy Services, Inc.*, 551 U.S. 224, 232 (2007).
[42] *Sierra Club v. Lyng*, 662 F. Supp. 40 (D.D.C. 1987).
[43] *Id*. at 42.

to endemic tree species posed by beetles, the proposal was "hardly consonant with preservation and protection of these [wilderness] areas *in their natural state*."[44] The court explained, "[o]nly a *clear necessity* for upsetting the equilibrium of the ecology could justify this highly injurious, semi-experimental venture of limited effectiveness."[45]

When the Forest Service went back to the drawing board and scaled down its beetle eradication proposal, the court gave the Service's amended decision relatively light judicial scrutiny. In *Sierra Club v. Lyng II*, the court upheld a decision to use "spot control" cutting to combat insect infestations in and around the wilderness area.[46] Far from demanding "clear necessity," as it had in *Sierra Club I*, the court in *Sierra Club II* construed the term "necessary" quite liberally, as allowing measures that "fall short of full effectiveness" so long as those measures are "reasonably designed" to limit the spread of infestation.[47] It was careful to note, however, that the Forest Service had significantly scaled back its initial plan to minimize disturbance in the wilderness and had adopted several preservation-oriented safeguards to ensure that control efforts would be made only to protect established colonies of endangered woodpeckers and other "high-value" natural resources.[48]

Going forward, it is possible that agencies will be more eager to invoke these two exceptions and authorize nonconforming tools and activities to restore degraded conditions or to control forest fires, disease, and infestations in wilderness areas. One can easily imagine the pressure that will be exerted on federal land managers to authorize incursions into wilderness when warming temperatures, drought, and longer summer seasons heighten the risk of devastating wildfires and exacerbate the spread of destructive insects and diseases.[49] In turn, courts may be more willing to give agencies wide latitude to define terms like "necessary" when it comes to technical management decisions related to climate change mitigation and adaptation.[50]

In undertaking heroic efforts to protect certain, human-selected endemic species and natural processes in wilderness areas, though, it is quite possible

[44] *Id.*

[45] *Id.* at 43 (emphasis added).

[46] *Sierra Club v. Lyng*, 663 F. Supp. 556 (D.D.C. 1987).

[47] *Id.* at 560.

[48] *Id.* at 557–59.

[49] *See* Federico Cheever, *The Phantom Menace*, 18 Penn. St. Env. L. Rev. 185, 187 (2010) (describing the detrimental consequences when policy makers and the law treat fire as either "a rare, unpredictable calamity – unique in its every appearance – unforeseeable or (2) a curable disease like polio," rather than an inevitable, natural condition).

[50] *See, e.g.*, *Hapner v. Tidwell*, 621 F.3d 1239, 1242, 1244–45 (9th Cir. 2010) (upholding Forest Service's decision to thin trees and prescribe burns on 1,100 acres of forest lands near residential areas to slow the spread of wildfires and diminish their intensity).

that we may lose more than we gain. Trammeling is trammeling, after all, and human intrusions and manipulations will make the land into something other than wilderness.

DOOMED TO EXTINCTION?

As the cases described above suggest, implementing the dual directives of preserving natural conditions while also avoiding manipulative extrinsic perturbations has never been a simple affair. Modern ecological complexity theory and climate change make it even more challenging.

Fifty years ago, it made a great deal of sense to "draw a line around a place and protect its objects from the commercial onslaught."[51] This is precisely what the Wilderness Act strives to do. In the mid-twentieth century, when the Act was passed, the human population was growing and Americans were becoming more affluent, with more free time and the means to travel to remote areas and to recreate with all sorts of mechanical or motorized devices. Meanwhile, industrialization – large-scale mining and a range of other activities resulting in pollution – was becoming more widespread and, in many cases, more destructive. In 1964, creating and maintaining a system of untrammeled preserves seemed desirable and even critical.

At the time, climax theory still prevailed in the scientific community. All a land manager needed to do to ensure that ecological conditions would return to a fully developed "climax" stage of succession was to avoid anthropocentric disturbances. We now understand that ecosystems are far more dynamic than previously believed, that disturbances such as fire are necessary for some types of ecological functions, and that the elusive state of "happy equilibrium" – the notion that there is a single "natural" condition that the system would move toward and maintain if left alone – is a fiction.

We also face a significant atmospheric phenomenon that scientists and land managers had barely contemplated in the 1960s – climate change. The physical characteristics of wilderness areas are inevitably and inexorably changing due to human impacts, causing some to believe that it is no longer appropriate to avoid deliberate interventions *anywhere* on the planet, including wilderness areas. It is reasonable to ask whether maintaining wilderness areas as wilderness will be possible in the future and whether devoting resources to such an effort makes any sense. Moreover, even if the effort is made, it is not at all clear that it will be possible to keep something both wild – untrammeled and unmanipulated – and natural – exhibiting only those processes and functions that would be found in

[51] Aplet & Cole, *supra* note 3, at 15.

nature absent human influence. An expert on the ecology of the Boundary Waters Canoe Area Wilderness in Minnesota argues that the "old model of wilderness management" must give way to more active interventions to control invasive species, prolific herbivores like white-tailed deer, and blow-downs and other effects of intensified storm events; otherwise, he posits, the boreal forest may end up looking like the Great Plains.[52]

For the Boundary Waters and many other areas, a dramatically warming climate may create a "no-analog" future.[53] Although land managers might look to historic ecological conditions, processes, and functions in southern or low-elevation areas to predict future conditions, processes, and functions in northern or high-elevation areas and to plan future scenarios and management responses, the science of bringing climate models down to the fine-scale level needed to make timely on-the-ground decisions may seem little better than reading tea leaves. Precipitation patterns, vegetative shifts, species migration and invasions, wind, and soil composition are likely to change in unpredictable ways.[54] As a result, the primeval characteristics that set an area apart and qualified it for wilderness designation will almost certainly change over time as glaciers melt and seasons change.

Temperature increases in the American West – where most wilderness areas exist – are likely to be even greater than the projected 3° to 10°F worldwide increase by the end of the century.[55] Storms, floods, drought, disease, insect infestation, fire, and species invasions will probably become more severe and widespread. The effects may be most intense at higher elevations, including alpine and subalpine wilderness areas.[56] Given their relative geographical

[52] Kate Tyler, *The Forest of the Future*, Bell Museum of Natural History Imprint Magazine (Jan. 9, 2007) (quoting Dr. Lee Frelich); Susan Galatowitsch, Lee Frelich, & L. Phillips-Mao, *Regional Climate Change Adaptation Strategies for Biodiversity Conservation in a Midcontinental Region of North America*, 142 Biological Conservation 2012–22 (2009).

[53] John Williams & Stephen Jackson, *Novel Climates, No-Analog Communities, and Ecological Surprises*, 5 Frontiers in Ecology and Environment 475–82 (2007); J. B. Ruhl, *Climate Change and the Endangered Species Act: Building Bridges to the No-Analog Future*, 88 Boston U. L. Rev. 1 (2008); Robin Kundis Craig, *Stationarity is Dead – Long Live Transformation*, 34 Harv. Env. L. Rev. 9 (2010).

[54] Galatowitsch, *supra* note 52, at 2012–22; Intergovernmental Panel on Climate Change (IPCC), Summary for Policymakers, *in* Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change 7–22 (M. L. Parry et al. eds., 2007).

[55] S. Saunders & M. Maxwell, *Less Snow, Less Water: Climate Disruption in the West*, The Rocky Mountain Climate Organization (2005), *at* http://www.rockymountainclimate.org/website%20pictures/Less%20Snow%20Less%20Water.pdf.

[56] A. Pounds et al., *Biological Response to Climate Change on a Tropical Mountain*, 398 Nature 611–615 (1999); Aníbal Pauchard et al., *Ain't No Mountain High Enough: Plant Invasions Reaching New Elevation*, 7 Frontiers in Eco. and Env. 479 (2009).

isolation and idiosyncratic environmental adaptations, mountains and montane species are "potentially the most threatened under impeding climate change."[57] Higher temperatures and longer summers are already causing glaciers to melt and snowpack to diminish. In the mid-twentieth century, Glacier National Park, most of which is managed as wilderness, had 150 glaciers. Today, there are twenty-six. Within the next decade or so, the glaciers for which this park was named will likely be gone.[58]

Meanwhile, more winter precipitation will fall as rain instead of snow, the periods of snowpack accumulation will be shorter, and earlier springtime warming will melt snowpacks earlier in the year.[59] Peak flows will occur sooner than the current pattern of early to mid-summertime peak flows, causing flooding and other adverse effects downstream.[60]

Plants are also strongly influenced by weather and climate. Heat and drought tend to stress and overwhelm the physiological capability and structural integrity of plants, making them more vulnerable to disease, parasites, and insects. Warm, dry conditions facilitate the spread of beetles, blister rust, needle blight, and other destructive insects and diseases. In a study that tracked nearly eighty undisturbed tree stands in wilderness and other protected federal areas since 1955, scientists found that 87 percent had experienced an increase in the rate of tree mortality due to insects; in the interior West, the dieback rate has doubled.[61]

Sudden Aspen Decline (SAD) is one example. Warming temperatures and droughts have enabled parasitical insects, otherwise rarely observed in western aspen stands, to flourish. The most susceptible trees grow on south-facing sides of mountains and foothills. In 2004, scientists in Colorado observed that aspens were dying in unprecedented numbers and that regeneration was not occurring. SAD has affected one fifth of that state's aspen groves. The loss of the aspens decimates the lush grasses that had sprouted under them, which in turn had trapped, filtered, and released clean water

[57] Frank A. La Sorte & Walter Jetz, *Projected Range Contractions of Montane Biodiversity under Global Warming*, 277 Proc. Royal Soc. Bio. Sciences 3401 (2010).

[58] Wendee Holtcamp, *Silence of the Pikas*, 60 BioScience 8, 8 (2010).

[59] National Oceanic and Atmospheric Administration, Analysis by the Rocky Mountain Climate Organization, Historical Average Monthly Temperatures from the Period 1961–1990, at 15, Fig. 3 (1997).

[60] Saunders & Maxwell, *supra* note 55; U.S. Global Change Research Program, *National Assessment of the Potential Consequences of Climate Variability and Change: Rocky Mountain/Great Basin Region* (2003), *at* http://www.usgcrp.gov/usgcrp/nacc/education/rockies-greatbasin/.

[61] *National Parks in Peril: The Threats of Climate Disruption* 1 (2010), *at* http://rockymountainclimate.org/website%20pictures/National-Parks-In-Peril-final.pdf.

into streams, rivers, and lakes.[62] Without the aspens, these ecosystem services are greatly diminished.

Forests are also being ravaged by the bark beetle – another insect that thrives under hotter, drier conditions. On the Colorado Plateau of Colorado, Utah, Arizona, and New Mexico, sustained heat and an extended drought during the past decade have facilitated the spread of the piñon bark beetle.[63] Ninety percent of the piñon pines in study areas within Mesa Verde National Park are dead – far more than were killed during an even drier period in the 1950s.[64] Most of the wilderness in Bandelier National Park is also at high risk.[65] Even in higher elevations at more northern latitudes, pine trees are suffering from bark beetle infestations. For the first time in recorded history, beetles are able to proliferate in high-elevation forests that historically were too cold to sustain them. Rocky Mountain National Park wilderness is well on its way to losing most of its large lodgepole pines, which will substantially change the endemic mixed-conifer forest ecosystem.[66]

The loss of these tree species due to higher temperatures and changing precipitation patterns, coupled with historic fire-suppression practices by land managers, creates conditions conducive for more frequent and more devastating crown fires and other high-intensity forest fires.[67] Scientists with the U.S. Forest Service Climate Change Resource Center believe that even relatively modest changes in mean climate will lead to substantial increases in area burned. For a mean temperature increase of 4°F, annual area burned by wildfire is expected to increase as much as five-fold. Ponderosa pine forests at mid to high elevations are already facing much harsher fire regimes due to fire suppression and drought. Crown fires in these forests will cause extensive tree mortality, severe soil erosion, water quality degradation, and nutrient losses.[68]

[62] Nicholas Riccard, *Climate Blamed for Aspen Deaths*, LA Times, Oct. 18, 2009. Healthy aspen stands support up to 2,000 pounds of native grasses per acre. *Id*.

[63] *National Parks in Peril*, *supra* note 62, at 2.

[64] *Id*. at 2; Craig D. Allen et al., *Forest Responses to Increasing Aridity and Warmth in the Southwestern United States*, 107(50) Proceedings of the National Academy of Sciences21289–94 (2010), *at* http://www.fort.usgs.gov/Products/Publications/pub_abstract.asp?PubID=22809.

[65] Allen, *supra* note 65, at; David N. Cole & Laurie Yung, *Park and Wilderness Stewardship: The Dilemma of Management Intervention*, *in*: Beyond Naturalness: Rethinking Park and Wilderness Stewardship in an Era of Rapid Change 1–11 (Cole & Yung eds. 2010).

[66] *National Parks in Peril*, *supra* note 62, at 3.

[67] Emily K. Heyerdahl et al., Climate Drivers of Fire in the Northern Rockies: Past, Present and Future (2010); Ron Neilson, *Vegetation Distribution and Climate Change*, U.S. Department of Agriculture, Forest Service, Climate Change Resource Center (2008), *available at* http://www.fs.fed.us/ccrc/topics/vegetation.shtml.

[68] D. McKenzie, Z. Gedalof, D. Peterson, & P. Mote, *Climate Change, Wildfire, and Conservation*, 18 Conservation Biology 890–902 (2004).

Meanwhile, there have been unprecedented shifts in the ranges of plant and animal species. Some species have climbed upward in elevation or migrated toward the North or South Pole as they seek areas within their temperature tolerances. New species have colonized cooler regions, including sea anemones in Monterey Bay and lichens and butterflies in northern Europe. A study of more than 1,700 species found "highly significant, nonrandom patterns of change in accord with observed climate warming in the twentieth century, indicating a very high confidence (.95%) in a global climate change fingerprint."[69] Some species, such as the Arctic fox, are occupying a smaller range – they have nowhere cooler to go.[70] In a 2004 paper in *Nature*, scientists concluded that climate change could shrink the ranges of 15 to 37 percent of all species so drastically that they would be "committed to extinction."[71] It is not possible to place the blame solely on climate change because other variables like habitat destruction due to development also play a role, but it seems more likely than not that a warming climate is a substantial factor in these rapid shifts.

Climate change is also likely to increase invasions by nonnative, noxious plant and animal species.[72] In Florida, record-breaking droughts have enabled melaleuca (also known as Australian paperbark), an invasive tree species, to spread throughout Everglades National Park, more than 85 percent of which has been designated as the Marjory Stoneman Douglas Wilderness – the largest eastern wilderness area and the only subtropical wilderness in the United States.[73] Melaleuca trees produce immense quantities of seeds and grow rapidly, crowding out native plants and dependent wildlife. Dense stands of melaleuca burn easily and with high intensity, potentially altering the area's hydrology by impacting soil composition, building land, and increasing transpiration rates.[74]

When surveyed about their ability to preserve native species, natural characteristics, and historic processes threatened by a changing climate, federal

[69] Camille Parmesan & Gary Yohe, *A Globally Coherent Fingerprint of Climate Change Impacts Across Natural Systems*, Nature 421: 37–42 (2003).

[70] Camille Parmesan, *Biotic Response: Range and Abundance Changes*, *in* Climate Change and Biodiversity 41–55, (Lovejoy & Hannah eds. 2005).

[71] Chris D. Thomas et al., *Extinction Risk from Climate Change*, Nature 427: 145–148 (2004).

[72] Susan A. Mainka & Geoffrey W. Howard, *Climate Change and Invasive Species: Double Jeopardy*, 5 Integrative Zoology 102–11 (2010).

[73] Susan McGrath, *Attack of the Alien Invaders*, Nat'l Geographic (Mar. 2005), http://environment.nationalgeographic.com/environment/habitats/attack-alien-invaders/#page=1; John Platt, *Record Droughts in Florida Fuel Spread of Invasive Plant Melaleuca* (Sept. 1, 2011), *at* http://www.mnn.com/earth-matters/climate-weather/stories/record-droughts-in-florida-fuel-spread-of-invasive-plant-melal.

[74] Frank J. Mazzotti, Ted D. Center, F. Allen Dray, & Dan Thayer, *Ecological Consequences of Invasion by* Melaleuca Quinquenervia *in South Florida Wetlands: Paradise Damaged, not Lost* (2011), *at* http://edis.ifas.ufl.edu/uw123.

land managers indicated that the Wilderness Act's directive to keep wilderness areas untrammeled could act as a barrier to adaptive management interventions.[75] Yet the Act does not contemplate, much less require, active restoration or enhancement of ecological functions to support native members of wilderness ecosystems.

Arguably, the failure to adapt wilderness management strategies in the face of changing conditions has resulted in an artificial construct of "a cursory snapshot of wild lands frozen in time."[76] Does it follow, then, that Congress should allow wilderness managers to employ active adaptive management interventions to promote the resilience of endemic species and natural systems, even if "wildness" must be sacrificed?

There are good reasons to say no. Scientists within the U.S. Forest Service – an agency that was once the most outspoken opponent of wilderness designations – recognize that protected wilderness areas will play an even more critical role in the future. Wilderness areas are ecologically important, despite climate-related changes, because they remain untrammeled by roads. In addition, wilderness areas provide "baseline" places where ecological lessons can be learned and used to test more intensive management strategies implemented in other areas.

THE VIRTUES OF ROADLESSNESS AND OF NATURAL BAROMETERS

The absences of roads and motor vehicles are hallmarks of federally protected wilderness areas, distinguishing these areas from all other categories of federal land. By contrast, motorized or mechanized means of transportation are quite common, even prevalent, in nonwilderness areas of national parks, national forests, BLM lands, and wildlife refuges. The National Forest System alone is home to around 390,000 miles of roads – enough to circle the globe fourteen times.

Conservative estimates indicate that more than 20 percent of the total land base in the contiguous United States is affected by roads, from jeep trails to interstate highways, although only one percent of the land is physically covered by roads. This is because the edge effects of roads – erosion, poor water and air quality, noise, and invasive species – extend well beyond the road corridor. Roads

[75] Lesley C. Jantarasami et al., *Institutional Barriers to Climate Change Adaptation in U.S. National Parks and Forests*, 15 Ecology and Society 33 (2010), *available at* http://www.ecologyandsociety.org/vol15/iss4/art33/.

[76] Sandra Zellmer, *A Preservation Paradox: Political Prestidigitation and an Enduring Resource of Wildness*, 34 Envt. L. 1015, 1042 (2004) (citing Reed F. Noss, *Sustainability and Wilderness*, *in* The Great New Wilderness Debate 410–11 (J. Baird Callicott & Michael P. Nelson eds. 1998).

are primary sources of soil, air, and water pollution, particularly in forested environments. Roads and activities facilitated by roads – such as logging, grazing, mining, and motorized recreation – generate chemical pollutants as well as increased sediments and changes to water temperatures and nutrient cycles.

Roadlessness, perhaps more than any other characteristic of wilderness areas, supports "natural" ecological processes and intact ecosystems. By remaining roadless, wilderness areas are suited to provide critical ecosystem services such as clean water. Healthy watersheds help maintain viable fish and wildlife populations. They also protect downstream communities from flooding by storing water and releasing it slowly over time, and they provide opportunities for many forms of outdoor recreation. Functioning wetlands, streams, rivers, lakes, and groundwater aquifers provide high-quality freshwater for domestic, agricultural, and industrial uses. The Forest Service estimates that "roadless areas within the National Forest System contain all or portions of 354 municipal watersheds contributing drinking water to millions of citizens." It concludes, "[c]areful management of these watersheds is crucial in maintaining the flow and affordability of clean water to a growing population."[77]

Wilderness areas also provide undisturbed migration corridors and large blocks of contiguous habitat for wildlife and plant species. Outside of wilderness and other roadless lands, roads have significant adverse effects on wildlife. Roads crisscross natural ecological boundaries, altering pre-existing patterns of movement and communication within and between ecosystems. The abundance and diversity of native species is diminished near roads, while opportunistic invasive species thrive in and near the clearings created by roads. Roads provide greater access for humans, contributing to direct death or injury to wildlife species from roadkill and hunting, as well as indirect effects due to pollution and noise. Ecologists believe that "no single feature of human-dominated landscapes is more threatening to biodiversity (aquatic and terrestrial) than roads."[78] According to Reed Noss, "[e]xperience on every continent has shown that only in strictly protected roadless areas are the full fauna and flora of a region likely to persist for a long time."[79]

The more that the climate and climate-impacted variables change, the more important it will be to collect and maintain data about the baseline conditions within wilderness and other roadless areas. In the context of scientific inquiry

[77] *Final Rule Protecting Inventoried Roadless Areas in the National Forest System*, 66 FED. REG. 3244, 3244–46 (Jan. 12, 2001) (to be codified at 36 C.F.R. pt. 294).

[78] Reed F. Noss, *Wilderness Recovery: Thinking Big in Restoration Ecology*, *in* THE GREAT NEW WILDERNESS DEBATE, *supra* note 77, at 521, 523. *See* Donald M. Waller, *Getting Back to the Right Nature: A Reply to Cronon's "The Trouble with Wilderness,"* *in* THE GREAT NEW WILDERNESS DEBATE *supra* at 540, 553.

[79] Noss, *Wilderness Recovery*, *supra* note 79, at 523.

and ecological management, wilderness areas serve as "barometers"[80] or "natural archives."[81] According to Aldo Leopold, wilderness is "a base-datum of normality, a picture of how healthy land maintains itself."[82]

Data collected in wilderness areas can guide future management decisions for lands within and outside of wilderness areas. According to forest ecologists, "[r]esearch in wilderness areas plays a critical role in disentangling natural and anthropogenic changes in ecosystems by providing a network of sites where local impacts are minimized relative to adjacent, more intensely managed areas."[83] Within wilderness areas, scientists have found "rich repositories of paleoclimate and paleoecological data (for example, tree rings, sediment cores, macrofossil deposits)," which foster greater understanding of climate-ecosystem interactions under conditions that are novel compared to current conditions.[84] The continued preservation of networks of wilderness and other large, undisturbed natural areas can "facilitate cross-site comparisons and cross-scale analyses necessary to elucidate the complex interactions between global changes and local response."[85] By comparing an undisturbed physical setting with more intensively managed areas, researchers will be better able to attribute changing conditions to human versus natural causes and better able to adapt their management strategies to achieve sustainable outcomes in both types of areas. Thus, scientific research based on conditions in wilderness areas will continue to be "critical to detecting the impact of climate change," discerning cause-and-effect relationships between human activities and environmental responses, and choosing among future management options for surrounding or similar areas.[86]

THE SPIRITUAL VALUES OF WILDERNESS[87]

Beyond scientific and ecological values, wilderness also provides matrices for other important cultural needs that arise in the context of civil society. There is

[80] 66 Fed. Reg. at 3245.

[81] Lisa J. Grumlich, U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station Proceedings RMRS-P-1 5-VOL-3, at 27 (1999).

[82] David N. Cole, *The Importance of Archiving Baseline Wilderness Data*, 13 Int'l J. of Wilderness 30, 30 (2007) (quoting Leopold, *Wilderness as a Land Laboratory*, 6 Living Wilderness 3 [1941]).

[83] Grumlich, *supra* note 82, at 27. *See* Peter M. Vitousek et al., Global Change and Wilderness Science, U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Proceedings RMRS-P-15-VOL-1, at 8 (2000).

[84] Grumlich, *supra* note 82, at 27.

[85] *Id.* at 31.

[86] *Id.* at 27.

[87] This subtitle is from Nagle, *Spiritual Values of Wilderness*, *supra* note 7.

something spiritual and transcendent about wilderness preservation. As Professor Jan Neuman argued, "[r]aised in a [modern] society . . ., luxury has outpaced ancestral understanding."[88] Making the choice of deliberate non-intervention in wilderness areas is one important means of kindling the fires of ancestral understanding of the world around us and deepening our awareness of and respect for nature's autonomy.

Although their writings were separated by several decades, both Henry David Thoreau and John Muir viewed wilderness as "a sanctuary of freedom, a refuge of sanity in an overcivilized world, and as somewhere to be profoundly humbled."[89] According to Thoreau, wildness "is the bog in our brains and bowels, the primitive vigor of Nature in us, that inspires th[e] dream."[90] Muir added, "[w]hile God's glory was written over all His works, in the wilderness the letters were capitalized."[91]

Today, federal wilderness areas provide peace, quiet, and a pathway to spiritual and physical well-being. These virtues remain intact through the constructive force of the Wilderness Act, which compels the identification and preservation of special places that are not subject to consumptive, commercial, and transformative uses by humans. Preserving untrammeled wilderness areas will continue to provide spiritual sustenance for present and future generations. Surely, as a society, we can afford to set aside at least one category of land holdings that are not subject to human domination.[92] We can hardly afford not to.

CONSERVATION IMPLICATIONS: "IN WILDNESS IS THE PRESERVATION OF THE WORLD"[93]

The objective of the Wilderness Act is to protect the wild, untrammeled characteristics of wilderness while letting endemic, unmanipulated processes and functions within wilderness take their course. As we now know, those processes and functions are complex, dynamic, and often unpredictable. Even when they are predictable, we might not care for their new direction – grasslands rather than forests in the Boundary Waters Wilderness, for example. Yet

[88] Troy L. Payne & Janet Neuman, *Remembering Rain*, 37 ENVTL. 105, 106 (2007).

[89] Zellmer, *Preservation Paradox*, *supra* note 77, at 1027.

[90] Henry David Thoreau, *Journal*, Aug. 30, 1856, epigraph to Simon Schama, Landscape and Memory (1995)).

[91] R. Nash, WILDERNESS AND THE AMERICAN MIND 125 (4th ed. 2001).

[92] Peter Landres, *Let It Be: A Hands Off Approach to Wilderness and Protected Areas*, in BEYOND NATURALNESS, *supra* note 3, at 92–93.

[93] Henry David Thoreau, *Walking*, in THE GREAT NEW WILDERNESS DEBATE, *supra* note 77, at 31, 37.

maintaining "untrammeled" wilderness areas still serves the purposes of both restraint – keeping it wild – and naturalness. As Howard Zahniser famously said, we should be guardians of wilderness, not gardeners.[94] A federal judge carried Zahniser's analogy forward into case law: "Nature may not always be as beautiful as a garden but producing gardens is not the aim of the Wilderness Act."[95]

The Wilderness Act teaches us that the law can and should support a noninterventionist stance. The Wilderness Act itself is the most restrictive statute in federal land management law, bar none, and it was intentionally designed to favor preservation over intervention, however well meaning such intervention may be. Letting nature take its course – evolutionarily and climatically – in wilderness areas, which comprise such a small slice of the U.S. land base, remains a valid and even imperative approach to land management. While other categories of land holdings may be and often are manipulated in deliberate ways to achieve higher resource outputs or greater biological diversity, wilderness provides a contrast and a baseline against which to measure and understand the effects of such manipulative activities elsewhere.[96] By enhancing our understanding of the natural world, in wilderness is the preservation of the human spirit – "the primitive vigor of Nature in us, that inspires th[e] dream."[97]

Adaptive management experiments aimed at restoring or maintaining natural processes and endemic species *outside* of wilderness areas will be more meaningful, and we can learn more from them, if wilderness is left alone to provide a contrast to areas that are manipulated. Although historic characteristics and variability can no longer be the primary reference points for decision making, learning more about how ecological systems have adapted and are adapting to stressors such as heat, drought, fire, and floods will be essential in planning for the future. Unless we understand a system perfectly – an impossible task – interventions aimed at increasing the stability of the system in a particular historic state may, in fact, increase the fragility of the system and do more damage than the perturbations that caused the degradation in the first place. An effective idea of wilderness would limit human interventions to those minimally necessary to remove previously or presently imposed human

[94] Howard Zahniser, *Guardians not Gardeners*, 83 The Living Wilderness 2 (1963).

[95] *Minn. Pub. Interest Research Grp. v. Butz*, 401 F. Supp. 1276, 1331 (D. Minn. 1975).

[96] *See, e.g.*, National Forest Management Act, 16 U.S.C. § 1604(e)(1) (Forests to be managed for sustained yields and multiple uses); Federal Lands Policy and Management Act, 43 U.S.C. § 1701(a)(7) (BLM lands to be managed for sustained yields and multiple uses); National Wildlife Refuge Administration Improvement Act, 16 U.S.C. §§ 668dd–668ee (wildlife refuges to be managed for wildlife conservation and biological diversity).

[97] Thoreau, Journal, *supra* note 91.

impediments to essential ecosystem processes that structure the area and enable wilderness watersheds to self-organize into a sustainable *and* wild regime – a resilient collection of mutually reinforcing, natural ecological processes.

But what about people? The Ninth Circuit Court of Appeals recognized that humans are an inevitable, if not integral, part of the picture, and that by making wilderness areas accessible for recreation and noncommercial uses, Congress did not require the land management agencies to "preserve the wilderness in a museum diorama . . . that we might observe only from a safe distance, behind a brass railing and a thick glass window."[98]

Humans have been, are, and will continue to be a fundamental part of all ecosystems on earth. Some might say this acknowledgement "is a radical departure from the [nature-centric] goal that has driven ocean and land conservation efforts for centuries – to protect or return nature to a pristine state."[99] But we need not draw such a hasty conclusion. Wilderness preservation is not antithetical to a concept of nature that includes humans. It simply forces humans to make hard choices, including nonintervention, when it comes to those relatively untrammeled and very special places we call wilderness. Rather than calling for us to take on duties of gardeners or, worse yet, curators of museum-like areas where managers struggle to keep historic features in place, "natural" wilderness calls for humble yet strategic stewards – guardians – of wilderness areas.

Where environmental law conceptualizes and prioritizes wilderness protection, it does so in far-reaching ways. Legitimizing the wilderness construct does not diminish other ideas of nature, even if it does raise questions about the ways that humans participate in being wild and natural. Rather, the existence of untrammeled places like wilderness enriches our understanding of nature and our relationship with the natural world, wherever we encounter it – be it in cultivated gardens, recreational parks, or wilderness areas.

[98] *Id.*

[99] Benjamin S. Halpern, *A New Goal for Nature: Healthy But Not Pristine*, Scientific American (Aug. 16, 2012).