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Managing the Balances of Nature: The Legal Framework of Wilderness Management

Daniel Rohlf*
Douglas L. Honnold**

[I]n wilderness is the preservation of the World.1
—Henry David Thoreau

INTRODUCTION

Wilderness has challenged the American spirit and defined the American character since the early days of the republic. Initially, we sought to tame the wilderness, to harness the rivers, and to exploit our abundant natural resources. During the last century, we have recognized that wilderness is something worth preserving. We now face the challenge of preserving wilderness, both by setting aside sufficient acreage as wilderness and by managing those areas chosen for protection so that they retain their wilderness character.

Most of America's wildlands were destroyed during the past century.2 A 1949 report prepared for the Library of Congress concluded that "original wilderness . . . will have disappeared entirely . . . [before long]. If then, there is reason for preserving substantial portions of the remaining wilderness, it must be decided upon before it is too late."3 By the time naturalist and author Wallace Stegner testified before the Outdoor Recreational Resources Review Commission in 1962, a growing number of people believed that compelling reasons existed to protect wil-

2. Between 1920 and 1955, for example, the American population grew from 106 million people to 166 million. This population boom led to growing demands for farmland, timber, minerals, fuel sources, and recreational opportunities, all of which increased pressure for the development of the country's remaining wild areas. See C. ALLIN, THE POLITICS OF WILDERNESS PRESERVATION 60-65 (1982).
derness. Stegner articulated the sentiments of this group when he la-
mented that "[s]omething will have gone out of us as a people if we ever 
let the remaining wilderness be destroyed[,] . . . if we pollute the last 
clean air and dirty the last clean streams and push our paved roads 
through the last of the silence."  

Attempts to protect substantial areas of the United States' remain-
ing wildlands date back to the early part of the 20th century. The U.S. 
Forest Service administratively established the first natural area in 1924 
by setting aside the Gila Wilderness in New Mexico. In 1929, the For-
est Service issued a directive authorizing the Chief of the Service to desig-
nate protected "primitive areas." The regulations governing the use of 
primitive areas were not very protective of the wilderness qualities of 
those areas, however, nor were they strictly enforced. Apparently rec-
ognizing these inadequacies, the Forest Service implemented new regula-
tions that strengthened wilderness protections, but World War II 
interrupted the process of designating areas to be governed by the new 
regulations. After the war, wilderness advocates began to press for stat-
utory wilderness protections out of concern that schemes for discretion-
ary administrative protection of wilderness would crumble in the face of 
demands for development.

Congress passed the Wilderness Act in 1964 in response to these 
concerns. In so doing, it implicitly acknowledged the concern of wilder-
ness advocates that existing administrative protection schemes were inade-
quate to ensure the preservation of wildlands. Congress hoped that a 
statutory mandate to preserve permanently large areas of federal land in 
an untrammelled, primeval condition would assure present and future 
generations an "enduring resource of wilderness." The issue of statutory wilderness protection has proven to be a rich

5. McCloskey, supra note 3, at 296.
6. J. HENDEE, G. STANKEY & R. LUCAS, WILDERNESS MANAGEMENT 61 (1978) (prepared for the U.S. Department of Agriculture) [hereinafter J. HENDEE]. Standards governing management of these areas were known as the "L-20 Regulations."
7. Id. at 61-62.
8. 36 C.F.R. §§ 251.20-.22 (1946) (now superseded). These were the so-called "U Regulations." See J. HENDEE, supra note 6, at 62-63.
10. J. HENDEE, supra note 6, at 63-64; McCloskey, supra note 3, at 297.
source of controversy since the idea was first proposed. Passage of the Wilderness Act itself came only after a long, arduous legislative process involving nine years of deliberation and consideration of sixty-five bills. The Act created the National Wilderness Preservation System and endowed it with 9.1 million acres classified by the Forest Service as “wilderness,” “wild,” or “canoe” areas. The wilderness system now encompasses 88.7 million acres of federal land, but its twenty-four-year growth has been marked by hard-fought political and legal battles over which areas Congress should designate as wilderness.

14. Early wilderness bills provided that the Secretaries of Agriculture or the Interior designate wilderness areas and that these designations become law unless vetoed by Congress. These bills also proposed to establish a Wilderness Council, composed of six private citizens and the heads of various federal agencies, to oversee wilderness protection. C. Allin, supra note 2, at 107. Representative Wayne Aspinall, Chairman of the House Committee on Interior and Insular Affairs, held up hearings on wilderness legislation, however, to force his position in favor of more congressional control of the designation process. Id. at 125. The Forest Service, not surprisingly, opposed any oversight commission. Id. at 111. Draft Senate wilderness bills in the early 1960’s accommodated these concerns, and the Senate passed a wilderness bill. S. 174, 87th Cong., 2d Sess., 107 Cong. Rec. 18,400 (1961); C. Allin, supra note 2, at 116-17. Action on wilderness legislation in the House, however, was held up for over a year by amendments and by what some perceived as a watered-down wilderness bill. The introduction of compromise bills vesting wilderness designation authority with Congress finally broke the impasse in the House in 1963. See id. at 132. In 1964, the House passed a bill after inserting provisions that allowed mining in wilderness areas. Id. at 135. A conference committee finally met to iron out differences between the House and Senate bills, and President Johnson signed the Wilderness Act on September 4, 1964. Wilderness Act of 1964, Pub. L. No. 88-577, 78 Stat. 890 (1964) (codified as amended at 16 U.S.C. §§ 1131-1136 (1982)); see C. Allin, supra note 2, at 135.


17. For example, acting on the congressional mandate to evaluate the suitability of other roadless lands for inclusion within the wilderness system, the U.S. Forest Service in 1971 undertook a “roadless area review and evaluation” (RARE) of 56 million acres in the 192 million-acre national forest system. See C. Allin, supra note 2, at 160-61. The recommendations of both the 1971 roadless area review and a subsequent review (RARE II) in 1979 met substantial opposition from advocates of wilderness protection, who argued that the reviews recommended too little land for designation as wilderness and proposed to open too much land to development. Id. at 160-65. The proposals contained in both RARE and RARE II essentially were rejected when the reviews themselves were successfully challenged in court for failing to comply with the National Environmental Policy Act. See California v. Block, 690 F.2d 753 (9th Cir. 1982); Comment, California v. Bergland: A Precarious Victory for Wilderness Preservation, 7 Colum. J. Envtl. L. 179 (1982). For further discussion of the roadless area review process and the controversy accompanying it, see Ferguson, Forest Service and BLM Wilderness Review Programs and Their Effect on Mining Law Activities, 24 Rocky Mt. Min. L. Inst. 717, 723-33 (1978).

The often turbulent histories of individual or statewide wilderness bills and ongoing controversies surrounding proposals for new wilderness areas further exemplify the conflicts characteristic of the designation process. The “River of No Return” Wilderness in central Idaho provides an example of a struggle over a controversial individual wilderness area. It finally was approved by Congress in 1980 after a nine-year struggle between environmentalists and developers. C. Allin, supra note 2, at 152-54. Pro-wilderness activists in Florida and New Jersey successfully battled proposed airports to secure protection for the Big Cypress Swamp.
In recent years, the focus of controversy under the Wilderness Act has begun to shift to the federal government's management of designated wilderness areas. Unlike disputes over wilderness designation, which fade once Congress acts to include or exclude the contested area, wilderness management controversies are ongoing because they center on how to implement on a day-to-day basis the Act's mandate to protect and manage wilderness areas. The debate over how to manage wilderness affects the entire National Wilderness Preservation System, and its resolution will determine whether the wilderness legacy Congress first created in 1964 will indeed be an enduring one.

This Article presents an interpretation of the legal framework that governs wilderness management. As a foundation to understanding how Congress defined "wilderness" in the Wilderness Act, Section I begins by considering the development of American conceptions of wilderness. It then explores the congressional purposes in enacting wilderness protection legislation. Section II analyzes the statutory and regulatory management schemes that govern wilderness management. Section III examines the practical application of these management schemes by exploring how the Wilderness Act circumscribes, and sometimes mandates, management actions both inside and outside the boundaries of wilderness areas. This Section describes specific controversies in which management practices within wilderness areas threatened the primeval character of those areas and evaluates how courts interpreted the Wilderness Act to resolve these disputes. It also considers the issue of protecting endangered species within wilderness areas. Finally, Section III discusses how wilderness managers should deal with situations in which human use of wilderness threatens to destroy the wilderness character of an area.

I

PROTECTING WILDERNESS

A. Definition of Wilderness Character

The Wilderness Act's fundamental management directive is to preserve the "wilderness character" of designated wilderness areas.\(^{18}\) To determine the scope of this management mandate, the term wilderness must be defined.\(^{19}\)

In 1755, Samuel Johnson in his *Dictionary of the English Language*...
defined wilderness as "a desert; a tract of solitude and savageness." Early European settlers in North America often equated wilderness with savageness, because they typically viewed wilderness from a religious perspective as symbolic of anarchy and evil. Later pioneers saw wilderness as empty land to be conquered or subdued, or as wasteland waiting to be made fruitful. These early notions defined wilderness by describing what it was not. Wilderness was uncivilized, unproductive, and uninhabited except by bands of "savages."

With increasing urbanization in the early 19th century, new concepts of wilderness developed. People focused on wilderness as a place to escape crowded and corrupt cities. They no longer perceived it as a forbidding emptiness, but as a haven. Estwick Evans described his motivation in journeying four thousand miles westward on foot in these terms: "I wished to acquire the simplicity, native feelings, and virtues of savage life; to divest myself of factitious habits, prejudices and imperfections of civilization... and to find amidst the solitude and grandeur of the western wilds, more correct views of human nature and of the true interest of man." The most prominent wilderness traveler and philosopher of the era, Henry David Thoreau, similarly believed that "[o]ur lives need the relief of [the wilderness] where the pine flourishes and the jay still screams." In contrast to the earliest American visions of wilderness, Evans and Thoreau considered the absence of humans and the predominance of nature as the principal virtues of wilderness. A similar vision motivated the first efforts to preserve and protect wilderness.

In the late 19th and early 20th centuries, naturalists began to examine the role of human beings in the natural world, rather than just to detail the physical and spiritual benefits wilderness provides to people. John Muir maintained that rattlesnakes, considered by most people to be

20. Id. at 3.
21. Id. at 34.
22. Id. at 27.
23. E. Evans, A Peedestrious Tour of Four Thousand Miles Through the Western States and Territories during the Winter and Spring of 1818, at 102 (1819), quoted in R. Nash, supra note 19, at 56.
25. Frederick Olmstead was taken by the beauty of the Yosemite area when he arrived in California in 1863; he immediately launched a campaign to declare it a park. The following year, the federal government granted Yosemite Valley to the State of California for public use, resort, and recreation. C. Allin, supra note 2, at 24-25.

In his influential book Man and Nature: or, Physical Geography as Modified by Human Actions, George Perkins Marsh examined the ecology of the Adirondacks and recommended preserving a portion of that mountain range in a primitive condition. G. Marsh, Man and Nature: or, Physical Geography as Modified by Human Actions (1864). In 1872, Congress became actively involved in preserving unique natural wonders by declaring Yellowstone the world's first national park. These events essentially marked the beginning of federal efforts to preserve land in its natural state. C. Allin, supra note 2, at 30-31.
dangerous pests, are "good for themselves, and we need not begrudge them their share of life." Muir further argued that "[t]he universe would be incomplete without man, but it would also be incomplete without the smallest transmicroscopic creature that dwells beyond our conceitful eyes and knowledge."

Aldo Leopold later expanded on these ideas to develop what he termed a "land ethic":

All ethics so far evolved rest upon a single premise: that the individual is a member of a community of interdependent parts. . . . The land ethic simply enlarges the boundaries of the community to include soils, waters, plants, and animals, or collectively: the land. . . . A land ethic of course cannot prevent the alteration, management, and use of these "resources," but it does affirm their right to continued existence, and, at least in spots, their continued existence in a natural state.

Thus, a new justification for wilderness preservation arose from the viewpoint that humans are merely a part of the natural community rather than its conquerors or sole beneficiaries and that all living things have a "right" to exist.

Leopold believed that wilderness also provides a standard for measuring the extent to which people adhere to the land ethic. He described wild areas as "a base-datum of normality, a picture of how healthy land maintains itself as an organism." To Leopold, wilderness was the land ethic's ultimate expression—an interdependent biotic community unimpaired by human manipulation.

The Wilderness Act's definition of "wilderness" reflects the evolution of the meaning of wilderness in American thought. The definition conveys two general ideas. First, like most early notions of wilderness, Congress defined wilderness in part by describing its lack of human de-

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29. Id. at 196.
30. The Act defines wilderness as follows: A wilderness, in contrast with those areas where man and his own 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. An area of wilderness is further defined to mean in this chapter 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.
velopment. Phrases used in the statutory definition of wilderness, such as "undeveloped Federal land," "without permanent improvements or human habitation," and "imprint of man's work substantially unnoticeable," suggest that absence of human settlements and physical evidence of human activities is one element of wilderness character. Second, Congress described wilderness as land "retaining its primeval character and influence," and "affected primarily by the forces of nature." These latter phrases capture the idea of wilderness as an area possessing an ecology that functions as it did for thousands of years prior to the arrival of nonaboriginal humans—in Leopold's terms, wilderness as a baseline "healthy" biotic community.

In sum, "wilderness" as defined by Congress in the Wilderness Act encompasses two distinct elements: (1) absence of human settlement, structures, roads, and similar evidence of human activities, and (2) presence of a healthy, natural ecology. The maintenance of these qualities should be the primary goal of wilderness management.

B. Purposes of the Wilderness Act

The Wilderness Act was a product of congressional compromise and encompasses somewhat divergent goals. The management scheme detailed in the Act reflects the range of goals lawmakers sought to achieve through wilderness protection legislation. To understand the Act's wilderness management directives, therefore, it is important to examine the reasons Congress passed the Wilderness Act.

In the second section of the Wilderness Act, Congress articulated two interrelated yet conceptually distinct purposes for preserving land as wilderness. First, Congress enacted wilderness legislation to protect land in its essentially natural state from "expanding settlement and growing mechanization." This purpose suggests that the lawmakers, like Muir and Leopold, believed that natural communities have an inherent right to exist. Second, Congress enacted wilderness legislation to pre-

31. See supra note 14.
32. These two purposes are set forth in the same section of the Act:

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. For this purpose there is hereby established a National Wilderness Preservation System to be composed of federally owned areas designated by Congress as "wilderness areas," and these shall be administered for the use and enjoyment of the American people in such manner as will leave them unimpaired for future use and enjoyment as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness.

33. Id.
serve wilderness areas for present and future generations to use, study, and enjoy. Even though Congress recognized that humans and their technology pose threats to wild areas, Congress clearly did not intend to exclude people from wilderness.34

The Wilderness Act's legislative history underscores the purposes articulated in the Act itself. In large measure, Congress was prompted to enact wilderness protection legislation because it recognized that wild areas are irreplaceable. A Senate report characterized wild areas as "living museums of geological, biological, ecological and many other values which could not be duplicated by a future generation at any cost."35 Senator Humphrey, one of nine senators who introduced the first wilderness bill in 1956, acknowledged the lawmakers' preservation goal when he commented:

[The Wilderness Act] will help us to insure that these federally owned wilderness lands . . . will be administered in such a way as to leave them unimpaired. And that is the crucial point, because once an act of destruction occurs in our wilderness areas, it cannot be undone. Prevention, in the form of a clear national policy, is far better than regret.36

Similarly, upon signing the Wilderness Act into law, President Johnson remarked that "[t]he Wilderness Bill preserves for our posterity, for all time to come, 9 million acres of this vast continent in their original and unchanging beauty and wonder."37

Preservation for its own sake, however, was not the sole reason for protecting wild areas from development. Lawmakers also justified their action in anthropocentric terms. Preserving outdoor recreational opportunities in wild areas was a major impetus behind passage of wilderness legislation.38 Additionally, Congress recognized the importance of wilderness preservation from a scientific standpoint. Representative Price urged:

34. See id.
38. In 1962, a blue ribbon Presidential commission predicted that by the year 2000 the use of wilderness-type areas would increase almost tenfold over 1959 levels. See Note, supra note 4, at 3 (citing ORRRC REPORT, supra note 4). The conclusions in the commission's reports helped to propel wilderness legislation forward, particularly in the House of Representatives. See C. ALLIN, supra note 2, at 125-26.

The explosion in outdoor recreation in subsequent years confirms the wisdom of protecting wilderness areas for this purpose. For example, 12.7 million recreational visitor days were recorded in 1985 within wilderness areas administered by the U.S. Forest Service. Edwards, Keeping Wilderness Areas Wild: Legal Tools for Management, 6 VA. J. NAT. RESOURCES L. 101, 117 (1986) (citing U.S. DEF'T OF AGRIC., REPORT OF THE FOREST SERVICE: FISCAL YEAR 1985, at 25 (1986)). That figure dwarfs the approximately 2 million "man-days" of use of Forest Service wilderness and primitive areas in 1959. Id. One "man-day" equals approximately 1.5 recreational visitor days. Id.
There are additional benefits to science and conservation in the preservation of wilderness. Here ecologists can study and measure the processes of nature as a check against man's artificial manipulation of his environment in other places . . . . Many kinds of scientific research are impossible except in areas where nature's processes are kept as undisturbed as possible.  

In short, the Wilderness Act and its legislative history demonstrate that Congress, like naturalist thinkers and writers, believed that wilderness preservation was important for a variety of reasons.

Congress debated long and hard before finally passing the Wilderness Act. Support for prohibiting development on large tracts of federal land was far from unanimous, even among federal land management agencies. Wilderness bills introduced in the late 1950's were opposed by the National Park Service, which feared limitations on development within national parks. The Forest Service also opposed these early legislative efforts out of concern that they would undermine "multiple use" management of federal land. Various commercial interest groups, particularly those representing lumber, mining, and power-generating industries, worried about curtailed access to resources. These groups testified and lobbied against wilderness protection until actual passage of the Wilderness Act.

Efforts by federal agencies and private interests to dissuade Congress from "locking up" selected areas as wilderness ultimately failed, the Wilderness Act itself suggests, because lawmakers believed they could have it two ways. Congress thought it could preserve pristine areas from development and yet avoid economic harm to local communities and development interests. Congress provided for mining, water and power development, grazing, and the control of fire and pests within wilder-

40. See C. Allin, supra note 2, at 110-11.
42. An official of the American National Cattlemen's Association, for example, testified that "[c]onservation should not mean neglect and waste such as this legislation would encourage." National Wilderness Preservation Act: Hearings Before the Senate Comm. on Interior and Insular Affairs, 85th Cong., 1st Sess. 398 (1957) [hereinafter Wilderness Act Hearings] (statement of Radford Hall, Executive Director, Am. Nat'l Cattlemen's Ass'n), quoted in C. Allin, supra note 2, at 113. Another wilderness opponent testified that "[t]he [C]hamber [of Commerce of the United States] believes that such lands should be managed primarily for their highest economic use. Other uses should be encouraged only when compatible with the major use." Id. at 414 (unsigned statement of the Chamber of Commerce of the United States), quoted in C. Allin, supra note 2, at 113.
44. Id. § 1133(d)(4).
45. Id.
ness boundaries, as well as the continued use of motorboats and aircraft within wilderness areas where such uses were already established. These uses are subject to limitations and conditions, but their inclusion in the Wilderness Act indicates that Congress desired to accommodate commercial interests to some degree.

Congress’ belief that wilderness protection could accommodate commercial interests is also manifested in the Wilderness Act’s legislative history. Senator Humphrey voiced this sentiment when he asserted: “None of us here in the Senate need fear that after the enactment of this measure the commercial interests, whom we all respect and value, will come to us and complain that they have been hurt. None of them will suffer damage.” The report accompanying the Senate version of the wilderness bill echoed Senator Humphrey’s remarks, as did the report accompanying the House version.

This exploration of Congress’ purposes reveals that Congress attempted to attain three goals in enacting wilderness legislation: preservation of wildlands, protection and maintenance of natural areas for uses such as recreation and scientific research, and accommodation of local and commercial interests. Obviously, these goals can conflict. Recreational and extractive uses can destroy designated areas’ wilderness character. Similarly, preservation of land in its pristine state may adversely affect local and commercial interests. The conflicting goals of the Wilderness Act pose a difficult dilemma for wilderness managers: how can each of Congress’ aims simultaneously be carried out with respect to designated wilderness areas?

II
LEGAL FRAMEWORK OF WILDERNESS MANAGEMENT

A. Statutory Direction to Wilderness Managers

When Congress designates an area for inclusion in the National Wilderness Preservation System, the federal agency with jurisdiction over the area immediately prior to the designation continues to manage it.

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46. Id. § 1133(d)(1).
47. Id.
49. “It is not too late in our disposition of the public lands and land holdings to meet the fast growing need for wilderness without damaging other interests, requiring real sacrifices, entailing enormous expenses, or requiring acceptance of second rate remnants.” S. REP. NO. 109, supra note 35, at 3 (emphasis added).
50. “In approaching the development of specific legislation, the committee was determined to act in the national interest with due regard to regional and local interests.” H.R. REP. NO. 1538, 88th Cong., 2d Sess. 2, 8 (1964) (emphasis added), reprinted in 1964 U.S. CODE CONG. & ADMIN. NEWS 3615, 3617.
51. This designation is made pursuant to 16 Ü.S.C. § 1132(b)-(c) (1982).
52. Id. § 1133(b).
The United States Forest Service, Fish and Wildlife Service (FWS), Bureau of Land Management (BLM), and National Park Service manage all of the federal wilderness areas in the United States.

The Wilderness Act contains two primary provisions that guide agency management of designated wilderness areas.\(^{53}\) Congress set forth the statute's principal management directive to wilderness managers in section 4(b).\(^{54}\) Section 4(b) restates the purposes for establishing protected wilderness and provides that these purposes can be supplemented as to specific wilderness areas by means of the individual bills designating the specific areas. Most significantly, section 4(b) requires federal agencies to preserve the wilderness character of designated wilderness areas. This requirement, read in conjunction with the Wilderness Act's definition of wilderness character,\(^{55}\) means that managers must preserve both the undisturbed, natural appearance and the ecological health of wilderness areas. Significantly, Congress phrased this preservation mandate affirmatively,\(^{56}\) suggesting that wilderness managers may be obligated to take affirmative actions to preserve or even restore wilderness character in addition to prohibiting or preventing activities that could harm wilderness character.\(^{57}\) Finally, Congress provided in section 4(b) that the duty to preserve wilderness character is subject to the exceptions set forth elsewhere in the Act.\(^{58}\)

In section 4(c), the Wilderness Act's other major management provision, Congress elaborated on the mandate to preserve wilderness character by listing types of objects and activities banned from wilderness areas, including roads, motorized vehicles and equipment, permanent structures, and commercial enterprises.\(^{59}\) The point of this provision

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54. Section 4(b) provides:
   Except as otherwise provided in this chapter, each agency administering any area designated as wilderness shall be responsible for preserving the wilderness character of the area and shall so administer such area for such other purposes for which it may have been established as also to preserve its wilderness character. Except as otherwise provided in this chapter, wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use.

55. Id. § 1131(c), quoted in full at supra note 30.

56. Each agency “shall so administer [a wilderness area]... as also to preserve its wilderness character.” 16 U.S.C. § 1133(b).

57. See infra notes 139-47 and accompanying text.

58. The requirements of section 4(b) apply “[e]xcept as otherwise provided in this chapter.” 16 U.S.C. § 1133(b) (1982).

59. In full, section 4(c) provides:
   Except as specifically provided for in this chapter, and subject to existing private rights, there shall be no commercial enterprise and no permanent road within any wilderness area designated by this chapter and, except as necessary to meet minimum requirements for the administration of the area for the purpose of this chapter (in-
from a wilderness management standpoint is clear: the listed objects and activities are inconsistent with the preservation of wilderness character and should not be permitted within designated wilderness areas. Section 4(c), however, is subject to exceptions.

Congress specifically enumerated a number of exceptions to section 4(c)'s prohibitions in section 4(d), subtitled "special provisions." Commercial services are permitted within wilderness areas pursuant to section 4(d) when "proper for realizing the recreational or other wilderness purposes." Roads, structures, and motorized transport, among other things, are expressly authorized in connection with the water resource or mining facilities allowed in wilderness areas under certain circumstances. In addition, two grandfather clauses contained in section 4(d) allow continued aircraft landings, motorboat use, and grazing if such uses were established prior to an area's designation as wilderness. Finally, the Secretary of Agriculture is permitted to take measures "as may be necessary in the control of fire, insects, and diseases, subject to such conditions as the Secretary deems desirable."

Section 4(c) itself also contains an exception to its list of prohibitions. Wilderness managers may take any action otherwise prohibited by the section provided that the action is "necessary to meet minimum requirements for the administration of the area for the purpose of [the Wilderness Act]." The breadth of this ambiguously phrased exception is uncertain. It appears, however, to require the satisfaction of two distinct criteria before an otherwise prohibited activity is exempted. First, the activity must be consistent with the "purpose" of the Wilderness Act. It is unclear why Congress used the singular, "purpose," in section 4(c), rather than the plural, "purposes," when referring to the aims of the statute. Congress articulated two related yet distinct reasons for protecting wilderness in the Wilderness Act's declaration of policy: preservation of vanishing wild areas and public use and enjoyment of those areas. Accommodation of local and commercial interests was another, albeit implied, purpose of the Act. Congress added yet another legiti-
mate statutory purpose in section 4(c): protecting the safety and health of people within wilderness areas.\textsuperscript{70} As noted previously, these multiple aims of the Wilderness Act can come into conflict. Providing maximum opportunities for people to use and enjoy a wilderness, for example, may not always be consistent with preserving that area in a wild state. Section 4(c) arguably requires only that an activity be consistent with one of the Wilderness Act’s several purposes in order to satisfy the first exemption criterion.\textsuperscript{71}

Assuming that a proposed activity would further a purpose of the Wilderness Act, the activity also must be “necessary to meet minimum requirements” for administration of a wilderness area for that legitimate purpose in order to qualify for a section 4(c) exemption. This standard is imprecise. One commentator points out that the word “minimum” is redundant because it seems to mean “necessary,” a term already part of the exception’s statutory language.\textsuperscript{72} Others interpret this phrase differently. They equate a “necessary” wilderness management action with a required—as opposed to a desired—activity. Further, if an action is truly necessary, according to this view, managers must implement it by means of the least disruptive methods. In other words, managers must use the “minimum” tools to accomplish the task.\textsuperscript{73}

The latter view, often termed the “minimum tool” standard, is most consonant with the general thrust of the Wilderness Act. Consider the following situation: a hiker is incapacitated by a life-threatening accident deep within a wilderness area. It is clearly “necessary” to rescue the stranded hiker,\textsuperscript{74} but there may be several ways to accomplish the rescue. The agency could reach the hiker by using a helicopter or by building a temporary road. A helicopter rescue would have the least adverse impact on the area’s wilderness character. Building a temporary road, by comparison, would physically alter the wilderness area in a manner no-

\begin{itemize}
  \item \textsuperscript{70} Minimum requirements for administration of wilderness areas include “measures required in emergencies involving the health and safety of persons within the area.” 16 U.S.C. § 1133(c) (1982).
  \item \textsuperscript{71} McCloskey implicitly supports this reading of the term “purpose” by arguing that interpreting the Wilderness Act to have more than one purpose allows wilderness administrators to extend their use of otherwise nonconforming equipment and facilities. See McCloskey, supra note 3, at 309-10.
  \item \textsuperscript{72} Id. at 309.
  \item \textsuperscript{73} See, e.g., THE WILDERNESS SOC’Y, THE WILDERNESS ACT HANDBOOK (1984), which states The fundamental guiding principle for administrative activities should be whether, given the conditions specific to that site, the action is necessary to protect physical and biological resources or enhance wilderness attributes of naturalness and solitude. If the action is deemed necessary then it should make use of methods and equipment which will accomplish the task with the least impact on the physical, biological and social characteristics of wilderness.
  \item Id. at 44.
  \item \textsuperscript{74} A rescue also would further a purpose of the Wilderness Act. See supra note 70 and accompanying text.
\end{itemize}
ticeable for many years. The helicopter rescue, therefore, is arguably the only alternative exempt from the prohibitions listed in section 4(c) because it deviates least from section 4(b)'s mandate to preserve wilderness character. As such, the helicopter rescue is the "minimum tool" to rescue the stranded hiker.

Although the section 4(c) exemption appears broad, it is circumscribed by two limitations: the Wilderness Act's fundamental directive to preserve the wilderness character of designated wilderness areas and the requirement that wilderness managers use the least disruptive, or "minimum," methods to carry out necessary management actions within designated wilderness. These limitations ensure that the administrative flexibility provided by the section 4(c) exemption does not undermine the primary goal of wilderness preservation.

B. Regulatory Standards for Wilderness Management

With the exception of the Park Service, the four federal agencies that together administer the Wilderness Preservation System each have promulgated regulations specifically addressing wilderness management. Although the Fish and Wildlife Service regulations merely track the statutory language of section 4(b), the Bureau of Land Management and Forest Service regulations interpret in detail the mandate that agencies administer designated wilderness areas to preserve their wilderness character.

The BLM and Forest Service regulatory schemes contain several noteworthy provisions. First, BLM and the Forest Service recognize in their regulations that an ecology not detrimentally affected by human action is a key element of an area's wilderness character. Second, BLM

75. The National Park Service manages wilderness areas within national parks under regulations promulgated to cover administration of all Park Service land. See W. EVERHART, THE NATIONAL PARK SERVICE 101 (1983).

In addition to regulations governing wilderness management, agencies prepare specific management plans for individual wilderness areas. For a detailed discussion of this planning process, see J. HENDEE, supra note 6, at 152-67.


77. The BLM regulations provide in relevant part:

Wilderness areas shall be managed to promote, perpetuate and, where necessary, restore the wilderness character of the land and its specific values of solitude, physical and mental challenge, scientific study, inspiration, primitive recreation, watersheds and water yield, wildlife habitat, natural plant communities, and similar natural and recreational values.

(a) Natural ecological succession shall be allowed to operate freely to the extent permitted by the Wilderness Act;

(b) Wilderness shall be made available for human use to the optimum extent consistent with the maintenance of wilderness character;

(c) In resolving conflicts in resource use, wilderness values shall be primary to the extent provided by the Wilderness Act or subsequent establishing legislation.

and the Forest Service provide that, where necessary, the agencies will carry out management actions to restore wilderness character. This indicates that both agencies interpreted section 4(b) as mandating that wilderness managers take an active role in restoring disturbed areas to their natural state, a view with potentially far-reaching implications. Finally, the Forest Service and BLM read section 4(b) as permitting restrictions on human use when restrictions are necessary to maintain wilderness character.

III

APPLYING WILDERNESS MANAGEMENT STANDARDS

A. Limits on Agency Actions Within Wilderness

Courts have faced wilderness management issues in only a handful of cases. This subsection examines two such controversies. One, *Minnesota Public Interest Research Group v. Butz*, involved a series of challenges to commercial logging within the Boundary Waters Canoe Area (BWCA) in northern Minnesota. The other controversy involved legal challenges to Forest Service measures to control southern pine beetle infestations in wilderness areas in the Southeast.

1. The Boundary Waters Canoe Area Controversy

Congress designated the BWCA a wilderness area in 1964 as part of its initial endowment of the National Wilderness Preservation System. The BWCA included some previously logged land, and a special provision in the Wilderness Act, as originally enacted, allowed commercial logging to continue within the BWCA to the extent consistent with "maintaining ... the primitive character of the area." The plaintiffs in *Minnesota Public Interest Research Group v. Butz* challenged Forest Ser-

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78. See infra notes 139-47 and accompanying text for a discussion of the affirmative obligation of managers to preserve wilderness.
79. See infra notes 164-70 and accompanying text.
80. See, e.g., Izaak Walton League v. St. Clair, 353 F. Supp. 698 (D. Minn. 1973) (upholding the right of the Forest Service to determine if a permit should be issued to allow mining within the Boundary Waters Canoe Area (BWCA)), rev'd on other grounds, 497 F.2d 849, cert. denied, 419 U.S. 1009 (1974). The only other cases directly involving management of designated wilderness areas are those of the Sierra Club v. Block series, infra note 98, and the Minnesota Public Interest Research Group v. Butz cases, infra note 81.
82. See supra note 15 and accompanying text.
vice proposals to permit extensive logging in the BWCA, including harvesting of previously unlogged forest areas.

In the *Butz I* decision, the district court was faced with the question whether the modification and extension of existing contracts for cutting of virgin timber in the BWCA constituted a major federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act. To answer this question, the court closely examined the impact of past logging activities on the primitive character of the BWCA. The court concluded that, even if followed by sophisticated reforestation efforts, the proposed logging would destroy the primitive character of the BWCA. It reached this conclusion after carefully examining the dynamics of northern forest ecosystems. The evidence indicated that logging disrupted the ecosystems by removing nutrients from the forest and by leaving tree stumps, roads, and improvements that would affect the forest for decades. Based on these factual findings of injury to the primitive character of the BWCA, the district court enjoined the defendants from logging “in those areas of the active timber sales on the BWCA which are contiguous with the main virgin forest areas of the BWCA.”

In a subsequent proceeding, the district court had to reconcile the Wilderness Act’s mandate to preserve the BWCA’s primitive character with the Act’s special BWCA provision, which “contemplate[d] that some logging will occur within the BWCA.” The court accomplished this task by first holding that timber harvesting restrictions are “necessary” within the meaning of the Wilderness Act “whenever timber harvesting interferes with the maintenance of the primitive character of the BWCA.” Finding that undisturbed forest was more primitive than areas where timber harvesting previously had taken place, the court concluded that “logging within previously logged over areas does not have as much of an adverse effect on the primitive character of the area[s] as does logging in virgin forest areas.” Based on these considerations, the court permanently enjoined logging within or adjacent to large tracts of previously unlogged forest. The Eighth Circuit reversed the district court’s decision, holding that the Wilderness Act and its legislative history indicated that Congress had authorized logging of previously unlogged areas.

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85. *Id.* at 617.
86. *Id.* at 610-11.
87. *Id.* at 630. The defendants were enjoined pending the Forest Service’s completion of an environmental impact statement.
89. *Id.*
90. *Id.*
91. *Id.* at 1332-33.
of the BWCA.\textsuperscript{92}

Despite the reversal by the Eighth Circuit, the district court's approach to interpreting the Wilderness Act is instructive. The court construed the provisions of the Wilderness Act so as to accord primacy to the congressional directive to preserve wilderness character. Furthermore, the court recognized that an important component of the primitive or wilderness character of a wilderness area is an ecology undisturbed by humans. In addition, the court adopted the "minimum tool" approach to resolving wilderness management controversies resulting from congressional authorization of activities inconsistent with the preservation of wilderness character.\textsuperscript{93}

Significantly, the district court applied the "minimum tool" management approach to an agency activity outside the ambit of section 4(c). By its terms, the provision of section 4(c) allowing activities "necessary to meet minimum requirements for the administration of the area" only exempts activities otherwise prohibited in section 4(c).\textsuperscript{94} The Forest Service's logging proposals for the BWCA, however, were issued under the authority of a provision in the originally enacted Wilderness Act that specifically related to the BWCA.\textsuperscript{95} Congress, through the special provision, directed the Secretary of Agriculture to adopt regulations that would ensure protection of the BWCA's primitive character, but it also specified that the regulations should be drafted "without unnecessary restrictions on other uses, including that of timber."\textsuperscript{96} The district court held that restricting logging activities within the BWCA to those areas where logging would have the least adverse impact on the primitive character of the BWCA was "necessary" within the meaning of the special provision.\textsuperscript{97} In so doing, the court interpreted the phrase "unnecessary restrictions" in the special provision as embodying the same restrictions on agency actions in wilderness as contained in section 4(c)—i.e., that agencies may use only the least disruptive or "minimum" means necessary to accomplish valid management goals within designated wilderness areas.

2. The Southern Pine Beetle Controversy

The most recent series of wilderness management cases also involved a dispute over tree cutting within wilderness boundaries. The

\textsuperscript{92}Butz II, 541 F.2d at 1298.
\textsuperscript{93}See supra notes 72-74 and accompanying text.
\textsuperscript{94}16 U.S.C. § 1133(c) (1982).
\textsuperscript{95}See supra note 83 and accompanying text.
\textsuperscript{97}Butz II, 401 F. Supp. at 1332.
plaintiffs in *Sierra Club v. Block* 98 and *Sierra Club v. Lyng* 99 challenged an extensive Forest Service tree cutting program aimed at halting the spread of southern pine beetle infestations in four federal wilderness areas in Arkansas, Louisiana, and Mississippi. 100

Southern pine beetles are endemic to southeastern forests. They decrease the value of commercial timber lands either by killing trees before they are harvested—and thus decreasing the value of their wood—or by forcing the premature harvest of timber stands threatened by beetle infestation. The beetles kill pine trees by burrowing through the bark, restricting sap flow, and introducing a deadly blue satin fungus into the trees. Such infestations can spread rapidly and ultimately may destroy thousands of acres of trees over a short time. On the other hand, infestations may become inactive after affecting only a small area. Nearly all of the several methods foresters use to attempt to control infestations involve cutting down infested trees and a “buffer zone” of surrounding uninfested trees. 101

During preliminary injunction proceedings in *Sierra Club v. Block*, 102 the Forest Service maintained that its extensive tree cutting efforts were “essential to preventing wide scale and irreparable destruction

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100. The wilderness areas involved in the cases are relatively small (each is less than 15,000 acres) and consist largely of mature stands of pine trees. The areas were extensively logged in the early 1900's, although few traces of this activity are evident today. The wilderness areas are surrounded by a mixture of public and private land, including land used for commercial timber production. *Block*, 614 F. Supp at 490. Limited tree cutting began in the Caney Creek Wilderness Area in Arkansas in 1983. In the 8,700-acre Kisatchie Hills Wilderness Area in Louisiana, however, the Forest Service had cut over 3,200 acres of trees by July 1985.

101. Various sizes of buffer zones have been employed by foresters in affected southeastern regions, ranging from a few feet to several hundred feet. These buffer zones are cut in the projected path of the beetle infestation, based on the theory that the beetles cannot spread if a sufficient clearing separates infested from uninfested trees. The “cut and remove” beetle treatment method involves removing felled trees by a timber sale, generally with the use of roadbuilding and heavy equipment. In the “cut and leave” treatment, trees are left where they fall. The final common treatment method involves leaving downed trees in place after soaking them with insecticide. See generally *FOREST SERV., U.S. DEPT OF AGRIC., FINAL ENVIRONMENTAL IMPACT STATEMENT FOR THE SUPPRESSION OF THE SOUTHERN PINE BEETLE 2-2 to 2-18 (1987)* [hereinafter *PINE BEETLE FEIS*].

by the voracious [southern pine] beetle."\textsuperscript{103} This argument suggests that the Forest Service either misunderstood or disregarded the congressional mandate to preserve the wilderness character of southeastern forests. Pine beetles have existed in southeastern forest ecosystems for thousands of years, with localized episodes of high beetle activity tending to occur roughly once every decade. Pine trees killed by beetles are often replaced by deciduous hardwoods, the climax vegetation\textsuperscript{104} of many southeastern forest ecosystems. When these hardwoods are destroyed by wildfire, another historically common natural phenomenon in the Southeast, pine trees quickly revegetate the burned-over areas and the ecological cycle begins again.\textsuperscript{105} The integral role played by insect infestations in the ecology of southeastern forests supports the argument that the Forest Service's attempt to control the beetle infestations was the activity that impaired the wilderness character of the areas, not the infestations themselves.

Prompted by the \textit{Sierra Club v. Block} litigation, the Forest Service apparently recognized that its primary justification for the beetle suppression program was inconsistent with statutory and regulatory wilderness management standards because the program harmed wilderness character. In an environmental impact statement (EIS) on southern pine beetle suppression released subsequent to the preliminary injunction proceedings, the Forest Service deleted "protection" of wilderness as a justification for attempting to control beetle infestations within designated wilderness areas. Instead, the Forest Service pointedly referred to sections of the Forest Service Manual requiring that wilderness management not interfere with natural ecological processes\textsuperscript{106} and recommended a substantial reduction in tree cutting designed to control pine beetles within federal wilderness areas.\textsuperscript{107}

The Forest Service's reevaluation of its southern pine beetle treatment program sets an important precedent for other wilderness management decisions made by federal agencies. For instance, lightning-caused wildfire is an important component of many wilderness ecosystems. Fire influences the species composition of plant communities, plays a key role in vegetative succession, controls pests and pathogens, and generally enhances the diversity of an ecosystem.\textsuperscript{108} Nevertheless, management


\textsuperscript{104} Climax vegetation is the stable plant community that emerges after a series of successional changes in an area's vegetation. \textit{See J. Hendee, supra} note 6, at 195-97.

\textsuperscript{105} \textit{See Pine Beetle FEIS, supra} note 101, at 4-3 to 4-4.

\textsuperscript{106} \textit{Id.} at 1-37 to 1-41.

\textsuperscript{107} \textit{Id.} at 2-41 to 2-42.

agencies routinely extinguish wildfires. The resolution of the controversy over pine beetle suppression should lead wilderness managers to restore natural fire regimes to wilderness areas and, more generally, to emphasize the importance of managing wilderness in a manner that minimizes interference with the natural ecology of such areas.

Despite recognition by the Forest Service that its efforts within designated wilderness areas to control southern pine beetles damaged wilderness character, the agency proposed to continue such tree cutting in an attempt to protect endangered red-cockaded woodpeckers and to prevent beetle infestations from spreading to adjacent timberland. The Forest Service argued that it had authority to carry out beetle control efforts within wilderness under section 4(d)(1) of the Wilderness Act, which permits the Secretary of Agriculture to take such actions “as may be necessary in the control of fire, insects, and diseases, subject to such conditions as the Secretary deems desirable.” Environmental groups, however, continued their legal challenge to the Forest Service program. The plaintiffs did not claim that the Wilderness Act absolutely prohibited the Forest Service from carrying out beetle suppression efforts within wilderness to protect commercial resources on adjacent land. Instead, they argued that the beetle control activities were not “necessary” within the meaning of section 4(d)(1) because the Forest Service had not demonstrated that its methods effectively controlled the beetle infestations.

In a decision issued after publication in draft form of the Forest Service’s beetle suppression EIS, the Lyng court concluded that section 4(d)(1) permitted the Secretary of Agriculture to take action to control fire, insects, or diseases within wilderness to benefit commercial interests on adjacent land. The force of this conclusion was tempered, however, because the court recognized that the Secretary’s discretion to take such action is limited when the action is motivated by a desire to benefit commercial interests. The court noted that such actions are inconsistent with the Wilderness Act’s primary directive to preserve wilderness character. Under such circumstances, reasoned the court, “the Secretary is not managing the wilderness but acting contrary to wilderness policy for the benefit of outsiders.” In an effort to limit potential abuse of this authority, the court imposed an affirmative burden on the Forest Service in such situations to justify its beetle control efforts within wilderness “by demonstrating they are necessary to effectively control the threatened

109. Id. at 10.
110. PINE BEETLE FEIS, supra note 101, at 2-41 to 2-42. See infra text accompanying notes 152-63 (discussing protection of threatened and endangered species).
111. PINE BEETLE FEIS, supra note 101, at 2-41 to 2-42.
114. Id. at 42-43.
115. Id. at 43.
outside harm that prompts the action being taken." The court then declined to resolve the case until the Forest Service submitted the final EIS.

The Forest Service moved for summary judgment to conclude the ongoing litigation after publishing its final EIS, which included additional information on the efficacy of its beetle control methods. The plaintiffs opposed the motion on the ground that the Forest Service had not scientifically proven that its methods effectively halted or slowed the spread of southern pine beetle infestations and, therefore, had failed to show that its program was "necessary" within the meaning of section 4(d)(1). The court acknowledged that doubt still remained about the degree of effectiveness of the Forest Service beetle control program but concluded that

[the pertinent section of the statute [section 4(d)(1)] is therefore most reasonably construed as allowing the Secretary to use measures that fall short of full effectiveness so long as they are reasonably designed to restrain or limit the threatened spread of beetle infestations from wilderness land onto the neighboring property, to its detriment.]

The court further held that it would not overturn the Forest Service's judgment that its beetle control program was reasonably effective unless that determination was shown to be "arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law." After finding no such abuse, the court granted summary judgment in favor of the Forest Service.

The Lyng litigation forced a court to wrestle with the attempt by Congress to accommodate commercial interests while at the same time preserving the wilderness character of wilderness areas. Naturally occurring fires, insects, and diseases are important components of wilderness ecosystems and elements of wilderness character. Thus, the lawmakers' grant of authority to wilderness managers under section 4(d)(1) to control these phenomena arguably was a response to concerns voiced by the Forest Service and timber industry representatives that adjacent lands be protected from threats originating within wilderness areas. In resolv-

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116. Id.
117. Id.
119. PINE BEETLE FEIS, supra note 101, at app. B.
120. Lyng II, 663 F. Supp. at 559.
121. Id. at 560.
124. The Wilderness Act's legislative history supports this interpretation. Commercial interests opposed to wilderness legislation feared that restrictions on federal authority to control
ing this conflict, the court acknowledged that the Wilderness Act permits agencies to control fire, insects, and diseases within wilderness to protect adjacent lands even if such actions impair wilderness character, but it limited the discretion afforded managers to take such actions.

Close analysis of the final opinion in the *Lyng* litigation suggests that the court imposed an affirmative burden on the Forest Service to justify its beetle suppression program because the court interpreted the Wilderness Act to require that, under section 4(d)(1), agencies employ the "minimum tool" approach when carrying out fire, insect, or disease control programs within wilderness. The court approvingly noted that the Forest Service beetle suppression plan made clear that the agency would not take any action within wilderness areas in attempts to slow the beetle's spread unless adjacent private landowners and federal authorities responsible for neighboring lands took all reasonable steps on their own land to halt the beetle infestations. The court favorably assessed this provision because it found that the requirement would "minimize any necessary intrusions on wilderness values." This language echoes the standard set forth in section 4(c) of the Wilderness Act, which exempts agency actions from the Act's prohibitions if the actions are "necessary to meet minimum requirements" of wilderness administration. Significantly, however, the court was construing section 4(d)(1), which does not refer to "minimum tool" management in authorizing measures within wilderness "as may be necessary in the control of fire, insects, and diseases." The *Lyng* court, therefore, essentially adopted similar reasoning to that used by the district court in the *Butz II* decision: when the Wilderness Act authorizes managers to take action within wilderness "necessary" to accomplish purposes of the Wilderness Act but inconsistent with preservation of wilderness character, managers may employ only those methods that have the least adverse effect on wilderness character.


126. *Id.* (emphasis added).
128. *Id.* § 1133(d)(1) (emphasis added).
B. The Affirmative Obligation to Preserve Wilderness Character

1. The Paradox of Human Intervention

A healthy, natural ecology is a vital component of the wilderness character of a wilderness area. Congress acknowledged this in the Wilderness Act by describing wilderness as land that "generally appears to have been affected primarily by the forces of nature" and that retains its "primeval character and influence." Paradoxically, maintaining the natural ecology of many wilderness areas requires human intervention:

What happens ecologically to our wilderness tracts once they are safely tucked away in the National Wilderness System? If we leave them completely alone, do they remain the same through time? Many references to the healing powers of nature imply a bland assumption by many that letting nature take its course will automatically provide a natural balance in the plant and possibly in the animal communities at hand. Although the nature-heals-all hypothesis may be valid in some vegetation areas where climax is self-maintaining and relatively stable, it certainly is not true in many others, for example in fire-maintained climaxes. In order to maintain highest biological quality in wilderness areas, especially those involving unstable communities, active management definitely is required.130

Many wilderness areas no longer have naturally self-sustaining ecologies because of the pervasive impact humans have had on the integrity of the major ecosystems in the United States. In many instances, humans have directly altered the ecologies of wilderness areas. For example, several wilderness areas in the southeastern United States were harvested for timber in the early 1900's. Many effects from logging are still apparent. One of the most notable is the makeup of plant communities. Southeastern forests typically contain a significant hardwood component, but previously logged areas consist mainly of pine forests because hardwoods were eliminated to make room for commercially valuable pine species.132

The elimination of native animal species, such as grizzly bears and wolves, also has directly affected many wilderness areas. Further significant changes in wilderness ecologies have resulted from the introduction of non-native flora and fauna, and exotic diseases. Finally, air and waterborne pollution directly and adversely affect wilderness ecologies.135

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129. Id. § 1131(c).
131. See Pine Beetle FEIS, supra note 101, at 3-26 to 3-38.
132. See id.
133. See J. Hendee, supra note 6, at 198-99.
134. Id. at 198-202.
135. Id. at 200.
Even where wilderness areas have escaped direct physical disturbances or contamination, their ecologies often have been affected by human activities. Wilderness areas essentially are "islands" surrounded by lands that frequently have been radically altered both physically and ecologically. Wilderness boundaries rarely if ever coincide with ecosystem boundaries. Thus, human activities within the area surrounding a designated wilderness typically occur within the same ecosystem and, therefore, usually affect the ecology of the wilderness area. Fire suppression on adjacent land, for example, can substantially affect a wilderness area that would have experienced periodic wildfires but for human activities on nearby land. The only way to restore the area's natural ecology in such a case may be through prescribed burning carried out by wilderness managers.

2. Preservation Versus Restoration

The fundamental directive to wilderness managers set forth in section 4(b) of the Wilderness Act is to preserve the wilderness character of areas within the National Wilderness Preservation System. The word "preserve" suggests a management approach concerned with maintenance of the ecological status quo. Given the significant direct and indirect human effects on the ecological component of the wilderness character of many designated wilderness areas, however, the question whether the Wilderness Act's primary management guideline can be interpreted to require agencies to restore wilderness character becomes extremely important.

The text of the Wilderness Act supports reading section 4(b) as embodying such a requirement. Elsewhere in the Act, Congress described wilderness as undeveloped land "protected and managed so as to preserve its natural conditions." If an area's ecology was altered by humans prior to its designation as wilderness, as is the case with several wilderness areas in the Southeast, management efforts must strive to restore natural conditions. Furthermore, active management designed to

136. See A.S. LEOPOLD, supra note 130, at 195.
137. For a general discussion of how human activities can affect wilderness ecologies, see J. HENDEE, supra note 6, at 197-202.
138. It is difficult to define what is "natural" for a given ecosystem. For example, can fires set periodically by aboriginal humans be considered "natural"? Most commentators and authorities define "primeval" or "natural" conditions in North America as the conditions that prevailed when an area was first visited by nonaboriginal people. See A.S. LEOPOLD, supra note 130, at 189. For a thought-provoking discussion of how humans and National Park Service policies have affected the natural ecology of Yellowstone National Park, see A. CHASE, PLAYING GOD IN YELLOWSTONE: THE DESTRUCTION OF AMERICA'S FIRST NATIONAL PARK (1986).
140. Id. § 1131(c) (emphasis added).
141. See supra note 131 and accompanying text.
restore wilderness character helps carry out Congress' aim of securing for "present and future generations . . . an enduring resource of wilderness." Finally, both the Forest Service and BLM have interpreted the Wilderness Act in their regulations to include an affirmative mandate to wilderness managers to restore wilderness character if necessary.

When acting to restore wilderness character, wilderness managers under some circumstances may employ methods otherwise prohibited in wilderness areas by section 4(c), such as use of motorized equipment and aircraft landings. The managers' authority to take restorative action should parallel their authority to act for preventive purposes. Section 4(c) exempts from its prohibitions management actions that are consistent with the purpose of the Wilderness Act and are carried out with the minimum adverse effects on an area's wilderness character. Efforts to restore wilderness character are consistent with the purposes of the Wilderness Act. When managers undertake restoration efforts using methods otherwise prohibited by section 4(c), therefore, such methods should be allowed if they are the "minimum tool" necessary to accomplish the project.

The scope of the Wilderness Act's mandate to restore wilderness character, however, is apparent neither from the statute nor from its implementing regulations. For example, it is not clear whether section 4(b) obligates wilderness managers to reintroduce native animal species, such as grizzly bears, that long ago vanished from areas now designated as wilderness. Nor is it clear whether managers must eliminate non-native species, such as ecologically destructive but recreationally popular sport fish. To date, management efforts aimed at restoring wilderness character generally have been limited to prescribed burning in a few wilderness areas. The precise obligations of wilderness managers to restore the natural—that is historical—ecological balance within wilderness undoubtedly will become increasingly important as knowledge of how humans affect wilderness ecologies increases.

C. Prevention or Management of External Threats to Wilderness Character

Human activities on land outside wilderness area boundaries, as explained in the previous subsection, can substantially affect the natural ecologies—and thus the wilderness character—of wilderness areas. The

143. See supra note 77 and accompanying text.
145. See supra note 59 and accompanying text.
146. Some prescribed burning has been carried out in giant sequoia groves in Yosemite, Sequoia, and Kings Canyon National Parks, for example. See J. HENDEE, supra note 6, at 271-72.
147. See supra notes 129-30 and accompanying text.
Wilderness Act's directive to preserve wilderness character requires managers to take affirmative actions within wilderness to mitigate these effects.\(^{148}\) It is not clear, however, whether the Act also requires wilderness management agencies to take preventive or affirmative actions outside wilderness areas to preserve wilderness character.

This issue is especially significant because federal agencies that administer wilderness areas frequently also are responsible for managing adjacent land.\(^{149}\) These agencies thus often are positioned to affect wilderness character through their policies and activities on adjacent land. Consider, for example, the scope of a federal agency's duty when evaluating several possible sites—one located near the boundary of a wilderness area administered by the agency—on which to permit construction of a large ore processing facility. Assuming the facility would adversely affect the area's wilderness character if located near the wilderness boundary, does the Wilderness Act's directive to preserve wilderness character require the managing agency to choose a different site?

No judicial decisions or agency regulations address this question. If all of the proposed sites for the hypothetical facility were equally feasible, however, the agency's duty to preserve wilderness character arguably would preclude it from permitting construction of the facility at the site near the wilderness boundary.\(^{150}\) But interpreting section 4(b)'s directive to preserve wilderness character as applicable to agency actions outside wilderness boundaries raises the difficult task of defining the scope of this mandate. For example, it is unclear whether section 4(b) would require that the agency in the hypothetical choose one of the other sites if the proposed site near the wilderness area were economically more attractive. Similarly, it is not clear whether the Wilderness Act would ban the facility altogether if the site near the wilderness boundary were the only feasible site on which to locate the facility.

In some cases, the Wilderness Act itself may render section 4(b)'s mandate to preserve wilderness character inapplicable to agency actions outside wilderness boundaries. Congress provided in section 4(a), for ex-

\(^{148}\) See supra notes 139-43 and accompanying text.

\(^{149}\) Typically, Congress designates as wilderness only a portion of a larger parcel of land managed by a federal agency. The agency continues to manage both the wilderness and adjacent land. See 16 U.S.C. § 1131(b) (1982).

\(^{150}\) Such an interpretation of the Wilderness Act would lend legal support to the concept of "ecosystem management." Proponents of ecosystem management argue that land use planning and land management decisions should be based on the effects management actions will have on ecosystems as a whole rather than on their effect on the political jurisdictions in which they are implemented. For example, 39 separate federal, state, and local government entities have jurisdiction over some portion of the greater Yellowstone ecosystem. Efforts are currently underway to coordinate the actions of these separate entities in order to preserve the delicate ecology of the region as a whole. See generally CONGRESSIONAL RESEARCH SERV., GREATER YELLOWSTONE ECOSYSTEM (1986) (prepared for the U.S. House of Representatives Committee on Interior and Insular Affairs).
ample, that the Act's purposes are "within and supplemental" to the purposes for which national forests, national parks, and national wildlife refuges are established. Consequently, section 4(b)'s directive to preserve wilderness character would not curtail the managing agency's authority to carry out activities on lands adjacent to wilderness when those activities are mandated by the federal statutes creating the national forests, parks, and wildlife refuges.

D. Protection of Threatened and Endangered Species

Because wilderness areas encompass large tracts of physically undisturbed land, they often provide important habitat for species listed as threatened or endangered under the Endangered Species Act (ESA). Under the ESA, agencies must refrain from undertaking or authorizing actions likely to jeopardize the continued existence of threatened or endangered species, and they must implement programs designed to promote the "conservation" of such species. In fulfilling these duties, federal agencies may be required to take affirmative actions within the wilderness habitats of listed species.

Most affirmative management actions taken within wilderness areas to promote the recovery of threatened or endangered species would not violate the prohibitions set forth in section 4(c) of the Wilderness Act, even if those actions involved, for example, motorized vehicle use, aircraft landings, or construction. Management actions designed to preserve or restore a specific element of an area's wilderness character, such as an endangered species, fall within the statutory exception to section 4(c)'s prohibitions, provided they are carried out by the means least disruptive to the area's wilderness character. In other words, efforts within wilderness to conserve threatened or endangered species seldom will conflict with the Wilderness Act as long as such efforts employ the minimum tools necessary to accomplish their purpose.

154. Id. § 1536(a)(1)-(2).
155. It is not clear whether 16 U.S.C. § 1536(a)(2) requires federal agencies to carry out programs to conserve listed species or merely authorizes agencies to carry out such programs at their discretion. See Carlson-Truckee Water Conservancy Dist. v. Clark, 741 F.2d 257 (9th Cir. 1984) (finding that this provision mandates that the Secretary of the Interior actively pursue a species conservation policy). But cf. 50 C.F.R. § 402.14(j) (1987) (Fish and Wildlife Service may provide discretionary conservation recommendations). If an agency's failure to act would jeopardize the continued existence of a listed species, however, the ESA requires the agency to act. 16 U.S.C. § 1536(a)(2) (1982 & Supp. IV 1986). See PINE BEETLE FEIS, supra note 101, at app. F (FWS Biological Opinion).
157. See supra text accompanying notes 144-45.
The Lyng litigation presented a situation in which the Wilderness Act's directive to preserve wilderness character appeared to be at odds with the mandates of the ESA. Red-cockaded woodpeckers, listed as an endangered species, inhabit southeastern forest ecosystems. These birds feed on, and nest in, mature living pine trees, a habitat vulnerable to destruction by southern pine beetles. Historically, losses of red-cockaded woodpecker habitat to beetle infestations did not substantially affect the woodpecker population as a whole; the widespread existence of varied habitat both ensured the availability of old growth habitat for the woodpecker and minimized the scope of insect infestations. In the last century, however, logging in southeastern pine forests has decreased red-cockaded woodpecker habitat to the point that only a few additional losses of quality habitat will adversely affect the species' chances for survival.158

The Forest Service recognized that it had a duty to protect red-cockaded woodpecker habitat from destruction by pine beetles. The Forest Service also realized, however, that pine beetle infestations and the resulting changes in plant and animal communities play an important ecological role in southeastern wilderness areas and, therefore, are an important element of the wilderness character of those areas. In the final EIS for the southern pine beetle suppression program, the Forest Service described the environmental conundrum that it faced: "The Forest Service could control [beetle infestations] and avoid jeopardy [to red-cockaded woodpeckers], but diminish the wilderness—or not control, and probably jeopardize the birds, but preserve wilderness integrity."159

The Forest Service ultimately resolved this perceived dilemma by deciding to take limited actions—including mechanized tree cutting—within wilderness areas in an attempt to prevent beetle infestations from destroying red-cockaded woodpecker habitat.160 It is not clear why the Forest Service hesitated to adopt this strategy. Attempts to halt pine beetle infestations are inconsistent with preserving wilderness character because such infestations play an important ecological role in southeast-

158. Red-cockaded woodpeckers require mature pine trees for shelter and foraging habitat. The woodpeckers usually live in clans consisting of an adult breeding pair and a number of additional birds. The woodpeckers hollow out cavities in mature living pine trees, where they may live for many years. The red-cockaded woodpecker was listed as an endangered species pursuant to the Endangered Species Act in 1970 because of declining populations directly resulting from habitat destruction. See 35 Fed. Reg. 16,047 (1970) (codified at 50 C.F.R. § 17.11 (1987)). Although wilderness areas sometimes provide good habitat for the birds, logging practices throughout most southeastern forest areas have created forests that generally are not suitable for red-cockaded woodpeckers because trees are harvested before reaching maturity. For further discussion of the habitat requirements and population trends of the red-cockaded woodpeckers, see PINE BEETLE FEIS, supra note 101, at app. F.

159. PINE BEETLE FEIS, supra note 101, at 1-36.

160. Id. at 2-41 to 2-42.
ern forest ecosystems. The Forest Service, however, did not hesitate to use its authority under section 4(d)(1) of the Wilderness Act to control insects within wilderness in an effort to protect valuable commercial resources on land outside wilderness boundaries.

The Lyng decision confirms that the Forest Service was unwarranted in hesitating to invoke its section 4(d)(1) authority to attempt to prevent southern pine beetles from destroying red-cockaded woodpecker habitat. The court recognized protection of outside resources as a valid aim of the Forest Service’s beetle control efforts within wilderness under section 4(d)(1), as long as the agency minimized adverse impacts on wilderness character. If section 4(d)(1) permits action within wilderness areas to protect commercial resources on nearby land, it must also allow wilderness managers to control fire, insects, and diseases when necessary to protect endangered species such as red-cockaded woodpeckers, even if such efforts harm wilderness character.

This conclusion is supported by two considerations. First, if section 4(d)(1) permits federal agencies to control fire, insects, and diseases within wilderness for the benefit of adjacent commercial land, something they are not legally obligated to do, it must allow federal agencies to fulfill their statutory obligations under the ESA. Second, actions to protect threatened or endangered species are more consonant with the preservationist tenor of the Wilderness Act than actions aimed at preventing economic damage to adjacent timber land. As with actions to protect outside resources, federal agencies must employ section 4(d)(1) control methods with the least adverse impact on wilderness character when acting for the benefit of threatened or endangered species.

In sum, reasonable and necessary efforts to control fire, insects, and diseases within wilderness to conserve threatened or endangered species do not conflict with the Wilderness Act.

E. Recreational and Other Noncommercial Human Uses of Wilderness Areas

Congress enacted the Wilderness Act to preserve wild areas from increasing settlement and development as well as to provide people with

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161. It may be tempting to argue that red-cockaded woodpeckers are an element of wilderness character and that attempting to save their habitat from destruction by beetle infestations, therefore, is consistent with preserving wilderness character. Pine beetle infestations, however, naturally cause localized changes in an area’s plant and animal communities. If sufficiently large areas in the southeastern United States were designated as wilderness and properly managed, these localized changes would not significantly diminish suitable red-cockaded woodpecker habitat on an areawide basis. Actions that destroy wilderness character may now be necessary because of modification, fragmentation, and destruction of red-cockaded woodpecker habitat throughout the bird’s range.

162. See supra notes 110-12 and accompanying text.

163. See supra notes 124-28 and accompanying text.
pristine areas to use and enjoy.\textsuperscript{164} Congress incorporated both of these purposes into statutory wilderness management standards by directing that wilderness areas "shall be administered for the use and enjoyment of the American people in such a manner as will leave them unimpaired for future use and enjoyment as wilderness."\textsuperscript{165} Substantial internal tension exists within this mandate, however, because inappropriate human use and simple overuse of wilderness areas can threaten wilderness character.\textsuperscript{166} Moreover, this tension becomes more pronounced as Americans' use of wilderness increases.\textsuperscript{167}

Preservation of an area's wilderness character arguably must prevail over human use of the area when the two come into conflict. By enacting the Wilderness Act, Congress sought to provide Americans with an opportunity to use and enjoy wilderness. If misuse or overuse destroys an area's wilderness character, the opportunity to use or enjoy the wilderness is lost to future generations—the precise result that Congress sought to avoid. In effect, therefore, wilderness managers must regulate wilderness use for the benefit of future as well as present users of wilderness. Both the Forest Service and BLM support this interpretation by providing in their regulations that preservation of wilderness values will prevail when preservation of wilderness character conflicts with present human use of the wilderness resource.\textsuperscript{168}

Wilderness managers may regulate or restrict uses of wilderness areas in many ways: by educating users about ecologically sound hiking and camping techniques, by promulgating and enforcing regulations governing conduct within wilderness, or by restricting access to wilderness areas.\textsuperscript{169} Some of these methods are more restrictive than others. It follows from the importance Congress placed on human use and enjoyment of wilderness that wilderness managers should impose only the minimum restrictions on such uses necessary to preserve wilderness character—a sort of "minimum tool" approach to allowable restrictions on wilderness use. The Forest Service and BLM have adopted such a policy by providing in their wilderness management regulations that "[w]ilderness will be made available for human use to the optimum extent consistent with the maintenance of wilderness character."\textsuperscript{170} These regulations, coupled with the directive to preserve wilderness for future generations, provide ample authority for federal agencies to impose such restrictions on human uses of wilderness areas as are necessary to protect wilderness character.

\begin{itemize}
\item \textsuperscript{164} See supra notes 32-38 and accompanying text.
\item \textsuperscript{165} 16 U.S.C. § 1131(a) (1982).
\item \textsuperscript{166} See Edwards, supra note 38, at 117-18.
\item \textsuperscript{167} Id.
\item \textsuperscript{168} See supra note 77 and accompanying text.
\item \textsuperscript{169} See Edwards, supra note 38, at 124-26.
\item \textsuperscript{170} 36 C.F.R. § 293.2(b) (1987) (Forest Service); 43 C.F.R. § 8560.6(b) (1987) (BLM).
\end{itemize}
CONCLUSION

In the Wilderness Act, Congress created a system to preserve some of America's last wild lands, areas "where the earth and its community of life are untrammeled by man." Most of the controversy surrounding the Act since its passage twenty-four years ago has centered on two issues: (1) how much land should be designated for inclusion in the National Wilderness Preservation System, and (2) which lands should be so designated. Future controversies involving the Wilderness Act are likely to focus increasingly on a third issue, which was the focus of this Article: the management of designated wilderness areas. The challenge to federal agencies charged with managing wilderness areas will be to ensure that they are managed to preserve their wilderness character. Wilderness management problems will range from the relatively simple, such as restricting human use of wilderness in order to preserve wilderness character, to the extraordinarily complex, such as attempting to restore a healthy, natural ecosystem in a small wilderness area surrounded by lands dedicated to other uses.

When confronted by difficult management decisions, wilderness managers should be guided by the primary objective of Congress in establishing the National Wilderness Preservation System: preserving the wilderness character of the last of America's wildlands. If special uses threaten wilderness character, those uses should be limited by the "minimum tool" approach embodied in section 4(c) of the Wilderness Act. The "minimum tool" approach permits actions that adversely affect wilderness character only when those actions are specifically authorized in the Wilderness Act and are the least intrusive means necessary to accomplish the task.

In the Wilderness Act, Congress sought to ensure that present and future generations of Americans would enjoy an "enduring resource of wilderness." The management of federal wilderness areas will determine whether this goal is fulfilled. Science, in this context, must serve the wonders of the natural world. Complex native ecosystems must be nurtured by management practices that take into account the balances of nature. Without proper management, the last of our remaining wildlands will disappear forever.

172. See supra notes 72-74 and accompanying text.