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ROBERT E. MANNING\*

# The Nature of America: Visions and Revisions of Wilderness

## Introduction

Passage of the Wilderness Act<sup>1</sup> by Congress in 1964 symbolized a remarkable revolution in American attitudes toward nature. In the minds of Americans wilderness had evolved from a source of fear and evil to a resource to be at first exploited, then later appreciated, conserved and, finally, preserved. Congress punctuated this revolution boldly and emphatically when it wrote into law that it shall be the policy of the United States to "secure for the American people of present and future generations the benefits of an enduring resource of wilderness."<sup>2</sup>

Wilderness has played a leading role in American history from the very beginning of settlement.<sup>3</sup> Burdened with the cultural baggage of their European heritage, the Pilgrims stepped from the Mayflower in 1620 on to the shores of "a hideous and desolate wilderness."<sup>4</sup> These religious zealots and their direct descendants thought the wildness of nature threatened not only their physical safety but also their spiritual well-being. In the conservative tradition of Judeo-Christian teachings, wilderness was viewed as the antithesis of the Garden of Eden and other heavenly graces. Cotton Mather, the fiery puritan preacher of colonial America, held forth to his congregation that the American wilderness harbored "Dragons," "Droves of Devils," and "Fiery Flying Serpents."<sup>5</sup> It was the Christian duty of each member of the congregation to clear away the evil wilderness.

Soon after the fringes of wilderness were cleared for settlement, American interest in nature turned exploitative. Nature was seen as a resource of raw materials to enhance the physical standards of life and to enable the fledgling nation to compete economically on world markets. Virgin

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1. Wilderness Act of 1964, 16 U.S.C. §§ 1131-1136 (1982).

2. *Id.* at § 1131(a).

3. See generally, R. NASH, *WILDERNESS AND THE AMERICAN MIND* (3d ed. 1982); H. HUTH, *NATURE AND THE AMERICAN: THREE CENTURIES OF CHANGING AMERICAN ATTITUDES* (1972); L. MARX, *THE MACHINE IN THE GARDEN: TECHNOLOGY AND THE PASTORAL IDEAL IN AMERICA* (1964); H. SMITH, *VIRGIN LAND: THE AMERICAN WEST AS SYMBOL AND MYTH* (1950).

4. W. BRADFORD, *OF PLYMOUTH PLANTATION 1620-47*, at 62 (S. Morison ed. 1952), cited in R. NASH, *supra* note 3, at 23-24.

5. C. MATHER, *FRONTIERS WELL-DEFENDED* 10 (Boston 1707), cited in R. NASH, *supra* note 3, at 29; C. MATHER, *THE WONDERS OF THE INVISIBLE WORLD* 13, 85 (London 1862), cited in R. NASH *supra*, note 3, at 29.

timber was cut, wildlife harvested, minerals mined, water harnessed, and the soil plowed and planted. All of these efforts were conducted on a massive scale and often in a wasteful manner for the material resources of nature were seen as "superabundant."<sup>6</sup>

By the end of the nineteenth century the natural environment of the United States had been altered dramatically and civilization had spread across the continent. The census of 1890 confirmed that there was no longer an American frontier; much of the wildness had been removed from the American wilderness. This led to a more appreciative view of nature based on a romantic nostalgia. Along with the growing affluence of American society came the leisure to appreciate nature . . . but nature was disappearing.

Nature was taking on another important scarcity value as well. The raw materials provided by wilderness had been the source of much of America's prosperity. But these resources were now seen as finite and in danger of being depleted. The conceptual foundation of the Conservation Movement of this period was to use these resources more thoughtfully and wisely so as to extend their availability indefinitely. As a consequence, millions of acres of public land, once slated for disposal into private hands, were retained in government ownership to foster a stewardship ethic.

More recently conservation has grown to include preservation. The environmental movement born in the 1960s has popularized the science of ecology and the interrelationships among living things. Man's very survival is seen as ultimately dependent on maintaining environmental quality. One of the most effective methods of protecting the environment is seen as preserving large areas of nature as wilderness.

It is clear that Americans now value wilderness. The National Wilderness Preservation System, established by the Wilderness Act, has now grown to more than 80 million acres. This is an area nearly twice the size of the New England region. Many more areas are now being studied for wilderness designation. Not quite as clear, however, is why we value wilderness so highly. The Wilderness Act itself is suggestive where it states that "wilderness areas shall be devoted to the public purposes of recreational, scenic, scientific, educational, conservation, and historical use."<sup>7</sup> Apparently wilderness can serve several diverse values. This paper surveys some of the multiple values that wilderness might serve in contemporary society.

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6. S. UDALL, *THE QUIET CRISIS* 66-80 (1963).

7. *Wilderness Act*, *supra* note 1, at § 1133(b).

### Wilderness Recreation

Perhaps the most tangible value of wilderness is recreation. People use wilderness directly as the focus of and setting for outdoor recreation activity. In absolute terms the statistics are impressive. It is estimated that designated wilderness areas within the national forests accommodated 12 million visitor days of recreation in 1985. Backcountry areas within the national parks accommodated approximately 1.7 million overnight stays the same year.<sup>8</sup> Relative statistics, however, present a somewhat different picture. Wilderness recreation accounted for only 5.3 percent of all outdoor recreation within the national forests in 1985.<sup>9</sup> Moreover, it is estimated that only 6 to 15 percent of the U.S. population has ever visited a designated wilderness area.<sup>10</sup>

But the value of wilderness for recreation cannot be measured solely on the basis of the number of people who visit. Much of its value lies as an anchor of the primitive end of a spectrum of recreation opportunities. Recreation research has revealed that there are many tastes in outdoor recreation and that there needs to be a corresponding diversity of opportunities to ensure a high quality outdoor recreation system.<sup>11</sup> This concept has recently been operationalized formally as the Recreation Opportunity Spectrum (ROS).<sup>12</sup> Wilderness recreation is one specialized type of recreation opportunity emphasizing naturalness, solitude, and freedom. As one type of recreation opportunity it is inherently no more or less valuable than any other type that may be found within ROS. Its value lies in its distinct contribution to a greater system of recreation opportunities.

However, wilderness does hold special recreation value to some people. Psychological research indicates that, like most other human activity, outdoor recreation is goal directed: people participate in outdoor recreation

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8. G. Stankey & R. Lucas, *Shifting Trends in Backcountry and Wilderness Use 7* (1986) (paper presented at First National Symposium on Social Science and Resource Management, Oregon State Univ.).

9. *Id.* at 9.

10. R. Young, *The Relationship Between Information Levels and Environmental Approval of the Wilderness Issue*, 11 J. ENVTL. EDUC. 25, 26-29 (Spring 1980).

11. R. MANNING, *STUDIES IN OUTDOOR RECREATION: SEARCH AND RESEARCH FOR SATISFACTION* 97-108 (1986).

12. R. CLARK & G. STANKEY, *THE RECREATION OPPORTUNITY SPECTRUM: A FRAMEWORK FOR PLANNING, MANAGEMENT AND RESEARCH* (USDA Forest Service Research Paper PNW-98, 1979); Brown, Driver & McConnell, *The Opportunity Spectrum Concept in Outdoor Recreation Supply Inventories: Background and Application*, in *PROCEEDINGS OF THE INTEGRATED RENEWABLE RESOURCES INVENTORIES WORKSHOP 73* (USDA Forest Service General Technical Report RM-55, 1978); Driver & Brown, *The Opportunity Spectrum Concept in Outdoor Recreation Supply Inventories: A Rationale*, in *RENEWABLE RESOURCES INVENTORIES WORKSHOP, supra*, at 24; Brown, Burns & McConnell, *The Outdoor Recreation Opportunity Spectrum in Wildland Recreation Planning: Development and Application*, in *2 FIRST ANNUAL NATIONAL CONFERENCE ON RECREATION PLANNING AND DEVELOPMENT: PROCEEDINGS OF THE SPECIALTY CONFERENCE 1* (1979).

to satisfy certain motives. Driver and associates have conducted extensive tests of recreation motives using Recreation Experience Preference scales.<sup>13</sup> A number of the motives found important to selected samples of recreationists are closely associated with wilderness.<sup>14</sup> Examples of such motives include enjoying nature, physical fitness, reduction of tensions, escaping noise/crowds, outdoor learning, independence, introspection, achievement, and risk taking. Without wilderness recreation opportunities, people seeking to satisfy these motives may be unfulfilled.

Wilderness also holds special value for more "pure" or highly developed forms of recreation. Sax,<sup>15</sup> in reflecting on a recreation policy for national parks, references the philosophical writings of Frederick Law Olmsted who emphasizes the need for opportunities for "reflective" recreation. Some forms of recreation evolve to exercise the "contemplative faculty" of participants where the emphasis is placed on technique and setting without the distractions of technology or other societal intrusions. The philosophical literature of fishing, hunting, and mountain climbing is suggestive of the need for natural, undisturbed environments to practice the highest forms of these recreation pursuits.<sup>16</sup> Some writers refer to these forms of recreation as "wilderness-dependent."<sup>17</sup> There is some limited empirical evidence of this phenomenon. Evolution of recreation activity from novice to more specialized forms has been documented for samples of fishermen, white-water rafters, and campers.<sup>18</sup> In each case, preferences evolve toward more natural settings which provide greater challenge for enhanced skills and experience.

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13. Driver, *Quantification of Outdoor Recreationists' Preferences*, in RESEARCH: CAMPING AND ENVIRONMENTAL EDUCATION 165 *passim* (Pennsylvania State Univ. HPER Series No. 11, 1976) (University Park, Penn.); Driver & Cooksey, *Preferred Psychological Outcomes of Recreational Fishing*, in CATCH AND RELEASE FISHING AS A MANAGEMENT TOOL: A NATIONAL SPORT SYMPOSIUM 27 *passim* (1977) (Humboldt State Univ., Arcadia, Cal.); Driver & Knopf, *Temporary Escape: One Product of Sport Fisheries Management*, 1 FISHERIES 21 *passim* (1976); Haas, Driver, & Brown, *Measuring Wilderness Recreation Experience Preferences*, in PROCEEDINGS OF THE WILDERNESS PSYCHOLOGY GROUP ANNUAL CONFERENCE 20 *passim* (1980) (Univ. of New Hampshire, Durham, N.H.).

14. See, e.g., Schreyer & Roggenbuck, *The Influence of Experience Expectations on Crowding Perceptions and Social-Psychological Carrying Capacities*, 1 LEISURE SCI. 373, 381-90 (1978); R. KNOPF & D. LIME, A RECREATION MANAGERS GUIDE TO UNDERSTANDING RIVER USE AND USERS 13-15 (USDA Forest Service General Technical Report WO-38, 1984); Brown & Haas, *Wilderness Recreation Experiences: The Rawah Case*, 12 J. LEISURE RES. 229, 232-36 (1980).

15. J. SAX, MOUNTAINS WITHOUT HANDRAILS: REFLECTIONS ON THE NATIONAL PARKS 17-46 (1980).

16. I. WALTON & C. CATLIN, *THE COMPLETE ANGLER* (1925); J. ORTEGA Y GASSET, *MEDITATIONS ON HUNTING* (1972); G. ROWELL, *IN THE THRONE ROOM OF THE MOUNTAIN GOD* (1977).

17. J. HENDEE, G. STANKEY & R. LUCAS, *WILDERNESS MANAGEMENT* 281-82 (USDA Forest Service Miscellaneous Publication 1365, 1977).

18. Bryan, *Leisure Value Systems and Recreational Specialization: The Case of Trout Fishermen*, 9 J. LEISURE RES. 174 *passim* (1977); Munley & Smith, *Learning-by-Doing and Experience: The Case of Whitewater Recreation*, 52 LAND ECON. 545 *passim* (1976); W. BURCH & W. WENGER, *THE SOCIAL CHARACTERISTICS OF PARTICIPANTS IN THREE STYLES OF FAMILY CAMPING* 13-18 (USDA Forest Service Research Paper PNW-48, 1967).

### Spiritual Values in Wilderness

Nature is such an imposing, powerful and all-embracing element of our world that its relationship to things spiritual or even religious is inevitable. Symbolic of this relationship is the fact that the word "wilderness" appears nearly 300 times in the Old and New Testaments.<sup>19</sup> However, as Stankey describes in a companion paper in this volume, wilderness has been subject to conflicting spiritual interpretations.<sup>20</sup> Earlier in this paper it was noted that the Puritans of colonial America viewed wilderness as the antithesis of God. Wilderness was generally interpreted, for example, as the physical and spiritual opposite of the Garden of Eden.<sup>21</sup> Perhaps nowhere is this more evident than in the Book of Joel which, in recounting the story of Adam and Eve, states that "The land is like the garden of Eden before them, but after them a desolate wilderness."<sup>22</sup>

Following the early colonial experience, American religious interpretations of nature became somewhat more benign, though their outcome was no more favorable. Following the teachings of Genesis, man was instructed to "be fruitful, and multiply, and replenish the earth, and subdue it: and have dominion over the fish of the sea, and over the fowl of the air, and over every living thing that moveth upon the earth."<sup>23</sup> Wilderness was seen simply as a storehouse of raw materials for man's earthly use. Nature was exploited accordingly and wilderness diminished.

More recently, nature, and its ultimate expression as wilderness, has been subject to more favorable spiritual treatment. Beginning in the nineteenth century, the Concord intellectuals, led by Ralph Waldo Emerson and Henry David Thoreau, formulated their complex philosophy of transcendentalism. Postulating a series of higher spiritual truths, transcendentalism suggested nature as a setting or even metaphor for such truths. "Nature is the symbol of the spirit" wrote Emerson.<sup>24</sup> Thoreau went further, suggesting that nature was God's purest creation and that the best way to know God and divine revelation was to get as close as possible to nature. The wilder and purer was nature, the better. In fact, nature may even be the physical manifestation of God. "Is not nature, rightly read, that of which she is commonly taken to be the symbol merely?" asked Thoreau.<sup>25</sup>

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19. R. NASH, *supra* note 3, at 13.

20. Stankey, *Beyond the Campfire's Light: Historical Roots of the Wilderness Concept*, 29 NAT. RES. J. (1989) (this issue).

21. R. NASH, *supra* note 3, at 15-16.

22. *Joel* 2:3.

23. *Genesis* 1:28.

24. R. EMERSON, *Nature*, in 1 NATURE, ADDRESSES AND LECTURES, THE WORKS OF RALPH WALDO EMERSON 31, 38 (Standard Library ed. 1883), cited in R. NASH, *supra* note 3, at 85.

25. H. THOREAU, *A Week on the Concord and Merrimack Rivers*, in 1 THE WRITINGS OF HENRY DAVID THOREAU 504 (Riverside ed. 1893), cited in R. NASH, *supra* note 3, at 85.

The transcendentalist interpretation of nature has been eagerly accepted by many wilderness enthusiasts. Notable among them is John Muir who viewed nature as "a window opening into heaven, a mirror reflecting the Creator."<sup>26</sup> Defending the Hetch Hetchy valley within Yosemite National Park from a proposed dam, Muir railed "Dam Hetch Hetchy! As well dam for water tanks the people's cathedrals and churches, for no holier temple has ever been consecrated by the heart of man."<sup>27</sup>

Today the transcendentalist tradition continues. Environmental degradation is often described as "desecration," a term with obvious religious overtones. John Denver celebrates the "cathedral mountains" of the Rockies. Spiritual values and personal introspection are often cited as important motives for people who visit wilderness areas.<sup>28</sup> A recent book by Graber has even suggested that wilderness preservation might be justified on the constitutional basis of maintaining religious freedom.<sup>29</sup>

### Wilderness and Culture

In the minds of many, wilderness has contributed to the distinctiveness of American culture. Nash, for example, notes that colonial America, like most fledgling nations, was defensive about its lack of established culture.<sup>30</sup> Americans had no grand history, art, or architecture which might compete with that of their European ancestors. Rather, one of the qualities which made America distinctive was the grandness and wildness of its nature. Many of America's first contributions to world culture celebrated its wilderness heritage. William Cullen Bryant was one of America's first great poets to gain international recognition and his subject was the romantic American forests. James Fennimore Cooper enjoyed a wide international following for his novels about adventure in the American wilderness. Thomas Cole, Frederick Church, Albert Bierstadt, Thomas Moran, and other American painters redefined the practice of landscape art with their emphasis on the power and sublimity of the American wilderness landscape. The image of America became closely associated with its wilderness condition.

Some suggest that wilderness shaped not only America's physical and mental image, but its personality as well. The most definitive treatment of this view is Frederick Jackson Turner's "frontier thesis."<sup>31</sup> Turner

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26. J. MUIR, *MY FIRST SUMMER IN THE SIERRA* 211 (1911), cited in R. NASH, *supra* note 3, at 125.

27. J. MUIR, *THE YOSEMITE* 261-62 (1912), cited in R. NASH *supra* note 3, at 168.

28. Driver, Nash & Haas, *Wilderness Benefits: A State-of-Knowledge Review*, in *PROCEEDINGS—NATIONAL WILDERNESS RESEARCH CONFERENCE: ISSUES, STATE-OF-KNOWLEDGE, FUTURE DIRECTIONS* 294, 302 (USDA Forest Service General Technical Report INT-220, 1987).

29. L. GRABER, *WILDERNESS AS SACRED SPACE passim* (1976).

30. R. NASH, *supra* note 3, at 67-83.

31. F. TURNER, *THE FRONTIER IN AMERICAN HISTORY* (1920).

believed that the pioneers' experience in the wilderness of the American frontier marked them with a sense of independence, rugged individualism, and self-worth which defines a distinctive American personality. Moreover, these characteristics developed out of the wilderness experience have been directly translated into our distinctive form of democratic government with its emphasis on maintaining personal freedom. "Out of his wilderness experience," Turner wrote, "out of the freedom of his opportunities, he fashioned a formula for social regeneration the freedom of the individual to seek his own."<sup>32</sup>

More recently, Wallace Stegner has given contemporary meaning to wilderness as a museum of our cultural heritage. The wilderness of America presented an opportunity for a new beginning, a place to build a better society. Preserving wilderness now and into the future celebrates our success and symbolizes our continued potential. As such, wilderness is "a part of the geography of hope."<sup>33</sup>

### Wilderness as Therapy

Wilderness has long been thought to have therapeutic value in both a physical and mental sense. Robert Marshall was one of the first to write about these qualities in a serious way. A prodigious hiker, Marshall's own adventures in the wilderness in the early 1900s convinced him of the physical benefits of wilderness use. "Toting a fifty-pound pack over an abominable trail, snowshoeing across a blizzard-swept plateau or scaling some jagged pinnacle which juts far above timber," he wrote, "all develop a body distinguished by soundness, stamina and elan unknown amid normal surroundings."<sup>34</sup> But the fact is that most people don't visit wilderness often enough to develop or maintain a true physical conditioning effect. Marshall also claimed that wilderness had psychological benefits. Marshall's thinking was influenced by Sigmund Freud and the developing science of psychology which suggested that mental dysfunctions were often caused by repressed desires forced upon us by the constraints of society.<sup>35</sup> Wilderness, argued Marshall, provided an opportunity to release those constraints and play out emotion and instincts.<sup>36</sup>

Therapeutic values of wilderness have received considerable attention of late. A substantial industry has grown up around these potential values, led by Outward Bound and the National Outdoor Leadership School. It

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32. *Id.* at 2, cited in R. NASH, *supra* note 3, at 146.

33. W. STEGNER, *THE SOUND OF MOUNTAIN WATER* 153 (1969), cited in R. NASH, *supra* note 2, at 262.

34. Marshall, *The Problem of the Wilderness*, 30 *SCI. MONTHLY* 141, 142 (1930).

35. R. NASH, *supra* note 3, at 202-03.

36. Marshall, *supra* note 34, at 143-44.



is estimated that there are now over 300 such programs.<sup>37</sup> A large number of studies have evolved at the same time which attempt to explore and document the therapeutic values of wilderness use.<sup>38</sup> Burton, for example, reviewed 72 studies of Outward Bound-type programs.<sup>39</sup> Most focused on participant reports or tests of self-concept or self-perception and most found a positive or beneficial effect. Driver and associates have conducted extensive tests of more general wilderness recreationists using the Recreation Experience Preference scales described earlier. Self-concept-related preference items, such as gaining a sense of self-confidence, are consistently found to be important to a large number of wilderness visitors.<sup>40</sup> Though many of the wilderness therapy studies have methodological shortcomings, there is a growing body of evidence to suggest that various therapeutic benefits from wilderness are real and forthcoming.

### Aesthetics of Wilderness

Aesthetics is another area in which wilderness has been subject to considerable revision and reinterpretation. Mountains, for example, were once generally considered as "warts, pimples, blisters and other ugly deformities on the Earth's surface."<sup>41</sup> The scientific advances of the Enlightenment first suggested that the wilder regions of the planet had some logic or order to them. These places, in fact, must have been created and shaped by God's own hand. This led to a more sympathetic and appreciative view of nature which flowered in the Romantic movement of the seventeenth and eighteenth centuries. Edmund Burke formally expressed this new aesthetic of nature in his book *Philosophical Enquiry into the Origin of Our Ideas of the Sublime and Beautiful* published in 1757. Wild nature, or wilderness, was still steeped with horror and terror, but was beautiful at the same time due to the awe and power it signified within us. Wilderness was sublime. It was this sublimity in nature that was first captured and illustrated by the American landscape painters described earlier.<sup>42</sup>

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37. L. Burton, *A Critical Analysis of the Research on Outward Bound and Related Programs passim* (1981) (Ph.D. Dissertation, Rutgers Univ.).

38. See, e.g., A. EWERT, *OUTDOOR ADVENTURE AND SELF-CONCEPT, A RESEARCH ANALYSIS* (1983) (College of Human Development and Performance, Univ. of Oregon); Driver, Nash & Haas, *supra* note 28; L. Burton, *supra* note 37; Levitt, *How Effective Is Wilderness Therapy?*, in *PROCEEDINGS OF THE THIRD ANNUAL CONFERENCE OF THE WILDERNESS PSYCHOLOGY GROUP* 81 (1982); Barcus & Bergenson, *Survival Training and Mental Health: A Review*, 6 *THERAPEUTIC RECREATION J.* 3 (1982); Gibson, *Therapeutic Aspects of Wilderness Programs: A Comprehensive Literature Review*, 13 *THERAPEUTIC RECREATION J.* 21 (1979).

39. L. Burton, *supra* note 37.

40. Driver, Nash & Haas, *supra* note 28, at 297-300.

41. R. NASH, *supra* note 3, at 45.

42. *Id.* at 45.

Robert Marshall developed additional sophistication of wilderness aesthetics. Marshall recognized that nature possesses unique aesthetic characteristics: it is detached from all temporal relationships in that it is not rooted in any one period of human history; it has an encompassing physical ambience in that we can be literally surrounded by its beauty; it has a dynamic beauty as it is always changing; it has the potential to gratify all of the senses in that it can be seen, heard, smelled, tasted, and felt; and it provides the best opportunity for pure or perfectly objective aesthetic enjoyment in that it is not created or affected by man.<sup>43</sup> Based on this philosophy of aesthetics, Marshall emphasized the special contribution wilderness might make to the quality of life. Asked how many wilderness areas we need, Marshall replied "How many Brahms symphonies do we need?"<sup>44</sup> Wilderness contributes to the quality of life and we should have as many wilderness areas as we can afford.

There is considerable evidence of the aesthetic value of wilderness today. The photographs taken by millions of visitors to the national parks and similar areas are symbolic as are the calendars and coffee table books published by environmental groups and others. The Recreation Experience Preference scales of Driver and associates are again instructive. The scale item "scenery" ranks as one of the most important motives of wilderness visitors.<sup>45</sup>

### Ecology and Wilderness

Ecology is a relatively new science. The very word "ecology" was not coined until the 1860s by German evolutionist Ernest Haeckel and means the study of living things and their interrelation with their environment.<sup>46</sup> Ecology is a complex and emerging science.

Rudimentary observations about ecological relationships—and the meaning they might have for wilderness preservation—were made in the United States in the early nineteenth century. It was during this time that George Perkins Marsh witnessed the large-scale clearing of Vermont hillsides for agriculture.<sup>47</sup> Simultaneously he observed changes in stream-flow patterns—more flooding with snowmelt and spring rains, and streams tended to run dry more often in late summer. Marsh theorized that it was the roots of trees which helped bond the soil together and allow water to percolate down slowly through the soil and eventually filter into streams.

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43. Marshall, *supra* note 34, at 144-45.

44. Flint, *Robert Marshall, The Man and His Aims*, Sunday Missoulian (Mont.) Nov. 19, 1939, cited in R. NASH, *supra* note 3, at 203.

45. Driver, Nash & Haas, *supra* note 28 at 303.

46. E. ODUM, *FUNDAMENTALS OF ECOLOGY* 3 (2d ed. 1959).

47. D. LOWENTHAL, *GEORGE PERKINS MARSH: VERSATILE VERMONTER* 3-29 (1958); J. CURTIS, W. CURTIS & F. LIEBERMAN, *THE WORLD OF GEORGE PERKINS MARSH* 7-18 (1982).

This mechanism provided a relatively constant source of stream flow. Without trees and their roots, water ran off the hillsides quickly, often washing the soil away with it. Marsh published his observations in 1864 in his important book *Man and Nature*.<sup>48</sup> Based on man's tendency to disrupt the interrelationships in nature, Marsh proposed keeping a large portion of "American soil . . . as far as possible, in its primitive condition."<sup>49</sup> His arguments were influential in convincing the citizens of New York to set aside the Adirondack region to protect the quantity and quality of water which flowed to downstate residents.<sup>50</sup> This was one of the first actions of large-scale wilderness preservation.

The environmental movement of today is based largely on concern for ecological relationships. Our current technological ability to modify ecological relationships on a massive scale may threaten our long term existence by disrupting vital components of our environment such as clean air and water, fertile soil, and a stable climate. Setting aside large areas of our natural environment as wilderness is viewed as one way to protect our future well-being.

Wilderness serves another ecological value in conserving biological and genetic diversity. The number of species on earth is unknown but generally estimated to exceed 10 million.<sup>51</sup> Although extinction of species is a natural phenomenon, the rate of extinction is believed to have increased sharply in recent years due to human modification of the environment.<sup>52</sup> The loss of biological and genetic diversity is of grave concern because of its current and potential usefulness to society. Plants and animals provide many benefits to society through their use in medicine, industry, and agriculture. Since most species are still unidentified or unstudied, their extinction poses a great potential loss to society. Wilderness helps preserve habitat, thus protecting endangered species as well as providing for continued evolution and speciation.

### Wilderness and Science

It was noted above that the science of ecology is relatively young. This means, among other things, that there is much more yet to be learned. Only about three percent of the United States is designated wilderness.

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48. G. MARSH, *MAN AND NATURE; OR, PHYSICAL GEOGRAPHY AS MODIFIED BY HUMAN ACTION* (1864).

49. *Id.* at 228, cited in R. NASH, *supra* note 3, at 105.

50. R. NASH, *supra* note 3, at 116-21.

51. N. MYERS, *THE SINKING ARK: A NEW LOOK AT THE PROBLEM OF DISAPPEARING SPECIES passim* (1979).

52. *Id.*; EHRlich & EHRlich, *EXTINCTION: THE CAUSES AND CONSEQUENCES OF THE DISAPPEARANCE OF SPECIES passim* (1981); N. MYERS, *A WEALTH OF WILD SPECIES: STOREHOUSE FOR HUMAN WELFARE passim* (1983).

If certain types of scientific knowledge can be obtained only from natural ecosystems, then wilderness holds special value for developing scientific theory and knowledge. Wilderness provides the only place, for example, to effectively study large-scale ecological processes such as forest succession and watershed function, and to study wildlife such as grizzly bears and wolves which have large home ranges. Some suggest that we don't yet fully appreciate the knowledge that may be forthcoming from wilderness. In the words of one environmental writer, wilderness "holds answers to questions man has not yet learned how to ask."<sup>53</sup>

Evidence suggests that wilderness areas are indeed used extensively as natural laboratories. A recent study of only a sample of officially designated wilderness areas within the national forest and national park systems found over 800 scientific publications focused on these areas.<sup>54</sup> Scientific disciplines covered included ecology, botany, zoology, and geology.

Wilderness can also serve the interests of science as an environmental control or baseline. In living out our day-to-day lives we must alter the environment around us. But what long-term effects are we having on that environment? Only through comparison to environmental control areas—the natural environments we preserve in wilderness—can we be certain. Aldo Leopold was the first to suggest this use of wilderness when he wrote that wilderness is "a base-datum of normality, a picture of how healthy land maintains itself as an organism."<sup>55</sup>

### Wilderness and Intellectual Freedom

Nash makes an interesting case that wilderness is the ultimate source of intellectual freedom or creativity.<sup>56</sup> Piecing together the writings of a number of natural philosophers, Nash suggests that wilderness provides the purest form of objectivity from which original thoughts might be derived. Unfettered by human influence, wilderness inspires intellectual creativity and diversity. Thoreau, for example, saw wilderness as the "raw material of life"<sup>57</sup> while Leopold viewed the history of human thought as "successive excursions from a single starting-point" which

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53. R. NASH, *supra* note 3, at 260 (statement of Nancy Newhall).

54. Butler & Roberts, *Use of Wilderness Areas for Research*, in PROCEEDINGS—NATIONAL WILDERNESS CONFERENCE: CURRENT RESEARCH 398, 400 (USDA Forest Service General Technical Report INT-212, 1986).

55. Leopold, *Wilderness as a Land Laboratory*, 6 LIVING WILDERNESS 1, 3 (1941), *cited in* R. NASH, *supra* note 3, at 198.

56. R. NASH, *supra* note 3, at 262-64.

57. H. THOREAU, *Walking*, in 9 THE WRITINGS OF HENRY DAVID THOREAU 277 (Riverside Ed. 1893), *cited in* R. NASH, *supra* note 3, at 88.

was the "raw wilderness."<sup>58</sup> The contemporary words "pathfinding," "trailblazing," and "pioneering" associate creative thought and scholarship with a wilderness context.<sup>59</sup>

Intellectual freedom inspired through wilderness has been found in several disciplines of human endeavor, including religion and the arts. The Puritans came to the wilderness of the New World to find spiritual freedom just as the Mormons went to the deserts of Utah. Similarly Thomas Cole and his followers found artistic inspiration in the wilderness. More recently, wilderness has even been suggested as a source of political freedom. Abbey, for example, writes that wilderness may someday be needed "not only as a refuge from excessive industrialism but also as a refuge from authoritarian government, from political oppression."<sup>60</sup> Similarly, Nash (1982) notes that George Orwell's police state society of *Nineteen Eighty-four* abolished wilderness because it "supported freedom of thought and action."<sup>61</sup>

### Wilderness as Moral and Ethical Obligation

Most of the wilderness values discussed thus far focus on human use of wilderness and how we might benefit from such use. An emerging notion suggests that wilderness and its component parts may have intrinsic value that we have a moral and ethical obligation to support. This notion stems from several sources.

Aldo Leopold was the first to suggest a "land ethic." As a scientist Leopold recognized that man was part of a larger ecological community. Just as we express moral and ethical rights to other members of our human communities, so should we extend such rights to members of our ecological community. "All ethics so far evolved," wrote Leopold, "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."<sup>62</sup>

Extension of moral and ethical considerations to the natural world is also supported by contemporary reinterpretation of Judeo-Christian teachings. Given that we have seriously depleted many of our natural resources, White suggests that the scripture contained in Genesis, as describe earlier in this paper, may suggest something different than it has traditionally.<sup>63</sup>

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58. A. LEOPOLD, *A SAND COUNTY ALMANAC AND SKETCHES HERE AND THERE* 200-01 (1949), cited in R. NASH, *supra* note 3, at 199, 264.

59. R. NASH, *supra* note 3, at 264.

60. E. ABBEY, *DESERT SOLITAIRE: A SEASON IN THE WILDERNESS* 149 (1968).

61. R. NASH, *supra* note 3, at 263.

62. A. LEOPOLD, *supra* note 58, at 239.

63. White, *The Historical Roots of Our Ecologic Crisis*, 155 *Sci.* 1203, 1206-07 (1967).

Man's dominion over other life forms may be more appropriately interpreted as expressing a stewardship responsibility rather than indiscriminate or unlimited use.

The "rights" of natural objects have even been tested in the court system. In the landmark case of the Mineral King Valley, California, Supreme Court Justice Douglas wrote that a wilderness had a right to legal standing in the court.<sup>64</sup> His, however, was a minority opinion.

Intrinsic rights of nature is a new and evolving concept in the environmental community. *A Journal of Environmental Ethics* has been established and some of the most thoughtful writing of contemporary environmental philosophers is focused on this subject.<sup>65</sup> Some suggest that the environmental movement is evolving from its "shallow" anthropocentric traditions to a new "deep" biocentric philosophy.<sup>66</sup> To all those who believe in the intrinsic rights of nature, preservation of wilderness is an expression of man's moral and ethical obligation to the environment.

### Economics of Wilderness

Though it may seem paradoxical at first, wilderness is seen by some as having substantial economic value. Indeed, this paper has discussed many values or benefits that wilderness might have to society and it seems reasonable to assume that such values might be measurable, at least theoretically, in traditional economic terms. As it turns out, some values are more readily measurable than others. In any case, a substantial body of economic literature has been developed that focuses on various aspects of wilderness valuation.

Some economic values of wilderness are relatively straightforward. Wilderness recreationists, for example, incur certain costs for travel and equipment and these costs constitute a minimum economic value of wilderness for recreation.<sup>67</sup> Actual costs are considered a minimum measure of value because recreationists may be willing to pay more than required and this additional increment, or consumer surplus, is a more accurate measure of actual value. Sorg and Loomis reviewed a number of willingness-to-pay studies of wilderness recreationists and found that most

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64. *Sierra Club v. Morton*, 405 U.S. 727, 741 (1972) (Douglas, J., dissenting); see also C. STONE, SHOULD TREES HAVE STANDING? TOWARD LEGAL RIGHTS FOR NATURAL OBJECTS 73-84 (1984).

65. See, e.g., H. ROLSTON, *PHILOSOPHY GONE WILD: ESSAYS IN ENVIRONMENTAL ETHICS* (1986); H. ROLSTON, *ENVIRONMENTAL ETHICS: DUTIES TO AND VALUES IN THE NATURAL WORLD* (1988); *ENVIRONMENTAL PHILOSOPHY* (R. Elliot & A. Gare eds. 1983); T. REGAN, *THE CASE FOR ANIMAL RIGHTS* (1983); C. STONE, *EARTH AND OTHER ETHICS* (1987); E. WILSON, *BIOPHILIA* (1984).

66. Naess, *The Shallow and the Deep, Long-Range Ecology Movement*, 16 *INQUIRY* 95 *passim* (1973); W. Devall, *The Deep Ecology Movement*, 20 *NAT. RES. J.* 299 *passim* (1980); W. DEVALL & F. SESSIONS, *DEEP ECOLOGY: LIVING AS IF NATURE MATTERED* *passim* (1985).

67. M. CLAWSON & J. KNETSCH, *ECONOMICS OF OUTDOOR RECREATION* 61-92 (1966).

values ranged from \$13 to \$20 per activity day, adjusted to 1982 dollars.<sup>68</sup> Additional economic value of wilderness recreation includes the contribution of this activity to national, local, and regional economies which provide related goods and services to wilderness recreationists.<sup>69</sup>

Some wilderness values are highly tangible. The high-quality water that flows off protected watersheds is used for drinking and irrigation. Compromises made in passing the Wilderness Act allow some wilderness areas to be used for commercial grazing and mineral production. Certainly the biotic and genetic diversity preserved in wilderness is increasingly used in a wide variety of commercial and medical applications. Little work has been done, however, to quantify these values in economic terms.<sup>70</sup>

Other wilderness values are less tangible. How do we value, for example, the vital ecological "services" provided by nature such as clean air and climatic stability?<sup>71</sup> Due to uncertainty, how can we value the future usefulness of biotic and genetic diversity?<sup>72</sup> The therapeutic, cultural, intellectual, aesthetic and spiritual values of wilderness may all benefit society through increased health and productivity, sense of pride and self-worth, innovation and pure enjoyment. But these values are difficult to quantify in dollar terms.

Finally, it has been suggested that wilderness may have unique values involving the preservation of natural environments. Decisions to develop natural environments are often irreversible. By preserving such areas as wilderness we may be creating and capturing option, existence, and bequest values.<sup>73</sup> By avoiding the irreversible decision of development, wilderness remains available as an option for those who do not now use wilderness but may wish to do so in the future. Alternatively, some people may have no expectation of using wilderness directly, but value the knowledge that such areas exist. Finally, some people may be imbued with a sense of social altruism and derive satisfaction and value in knowing that future generations have been endowed with or bequeathed wilderness. Empirical tests suggest that option, existence, and bequest values can be

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68. C. SORG & J. LOOMIS, EMPIRICAL ESTIMATES OF AMENITY FOREST VALUES: A COMPARATIVE REVIEW 18-20 (USDA Forest Service General Technical Report RM-107, 1984).

69. Walsh & Loomis, *Contribution of Recreation to National Economic Development*, in A LITERATURE REVIEW: THE PRESIDENT'S COMMISSION ON AMERICANS OUTDOORS in V35 *passim* (1986) (U.S. Government Printing Office); Alward, *Local and Regional Economic Impacts of Outdoor Recreation Development*, in A LITERATURE REVIEW: THE PRESIDENT'S COMMISSION ON AMERICANS OUTDOORS, *supra*, at V47 *passim*.

70. L. IRLAND, *WILDERNESS ECONOMICS AND POLICY passim* (1979).

71. Westman, *How Much Are Nature's Services Worth?*, 197 *Sci.* 960 *passim* (1977).

72. Bishop, *Endangered Species and Uncertainty: The Economics of a Safe Minimum Standard*, 60 *AM. J. AGRIC. ECON.* 10 *passim* (1978).

73. Krutilla, *Conservation Reconsidered*, 57 *AM. ECON. REV.* 777 *passim* (1967).

substantial, even outweighing more tangible wilderness benefits. A recent study of public support for wilderness preservation in Colorado, for example, found that the average family would be willing to pay \$14 per year to preserve the state's wilderness areas as recreation reserves. These same families, however, would be willing to pay even more—an additional \$19 per year—to be comforted in knowing that such areas exist and are being protected for future generations.<sup>74</sup>

### Conclusions

A close reading of the Wilderness Act suggests that Congress expected wilderness might have several values in contemporary society. The survey of wilderness values outlined in this paper confirms and even expands this expectation. Wilderness advocates, philosophers, and researchers have identified numerous and diverse ways in which preservation of wilderness can serve the needs of society now and in the future.

Some wilderness values are more direct or tangible than others. Wilderness recreation, for example, would seem to require one's direct physical presence in wilderness. However, maintenance of vital ecological services, such as air and water purification, requires no direct human use and, in fact, may be more efficiently carried out under such conditions. It seems clear that even though only a minority of the population use wilderness in the direct and narrow sense of the term, society can still find great value in wilderness.

Similarly, the diversity of wilderness values suggests that they may accrue to society differentially. Some of the more tangible values of wilderness, such as commercial grazing, are directly traceable and limited to certain groups in society. Other values, such as protection of biotic and genetic diversity, accrue to all members of society, knowingly or unknowingly. The distribution of these benefits through society may have important public policy implications, such as how the costs of wilderness preservation should be allocated.

Knowledge about wilderness values is limited and uneven. Although there is widespread support for wilderness preservation, general appreciation of wilderness is probably vague and intrinsically felt. A more highly developed wilderness philosophy would help guide public policy determinations such as how much and which lands should be allocated to wilderness, how should wilderness be managed, and how should limited wilderness research funds best be spent.<sup>75</sup> Some wilderness values,

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74. Walsh, Loomis & Gillman, *Valuing Option, Existence and Bequest Demands for Wilderness*, 60 LAND ECON. 14, 19-26 (1984).

75. See generally, R. NASH, *supra* note 3; Driver, Nash & Haas, *supra* note 28.



for example, are poorly documented, relying on classic philosophical writings or anecdotal evidence for their existence. More sophisticated theoretical and empirical development of wilderness values, including estimates of more traditional economic benefits, would help build a sounder foundation of wilderness values.

Apparent within this discussion of wilderness values is the notion that some values may conflict. Recreational use of wilderness, for example, causes environmental impacts and thus may diminish the value of wilderness for scientific or spiritual purposes.<sup>76</sup> As the more indirect or intangible values of wilderness become more explicitly and widely appreciated, these conflicts are likely to grow into intense management issues. It seems likely that in the future some wilderness will be managed for little or no direct human use.

Finally, wilderness values are clearly evolving. At the beginning of this paper it was suggested that American attitudes toward wilderness have undergone a remarkable revolution. This theme is evident throughout the ensuing discussions of wilderness values. Originally, our vision of wilderness reflected little or no value. However, as society and wilderness have changed, so has our vision. It seems likely that as society continues to change, the meaning of wilderness will be subject to continued revision. As wilderness becomes ever more scarce, many of the values of wilderness discussed above are likely to grow. Others are yet to be discovered.

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76. Manning, *Impacts of Recreation on Riparian Soils and Vegetation*, 15 WATER RES. BULL. 30 *passim* (1979); W. HAMMITT & D. COLE, WILDLAND RECREATION: ECOLOGY AND MANAGEMENT 27-127 (1987).