Environmental Values, Environmental Ethics, and Wilderness Management—An Empirical Study

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Abstract: This study explored the environmental values and ethics of wilderness visitors and how these influence attitudes toward wilderness management. Visitors to the Breadloaf Wilderness in Vermont, USA, supported multiple values of wilderness, including recreation, aesthetics, ecological protection, and scientific research. Visitors also subscribed to a diversity of environmental ethics, including anthropocentric (including stewardship and utilitarian ethics) and biocentric (including radical environmental ethics). Visitor values and ethics explained 37% of the variance in attitudes toward a series of wilderness purism-related management issues. Study findings suggest that increasing conflict over wilderness management may be inevitable, that protection of the ecological integrity of wilderness is essential to satisfy the multiple values and ethics of wilderness visitors, and that wilderness should be managed more systematically to meet the diverse and sometimes competing values and ethics of wilderness visitors.

Since passage of the Wilderness Act (PL 88-577) in 1964, wilderness management has emerged as an important public policy issue. Specific wilderness management issues are highly diverse and include the role of natural fire in wilderness ecosystems, reintroduction of predators, environmental impacts of recreation, visitor crowding, appropriate recreation activities, and the level and type of visitor facilities and services. In many cases, these issues are highly controversial.

Information on visitor attitudes toward such issues can help guide wilderness management, and a number of such studies have been conducted (Stankey 1973; 1980; Lucas 1980; Hendee et al. 1988; Watson et al. in press). However, it may be equally useful to explore the underlying ideas that may drive such attitudes. We think the environmental values and ethics of wilderness visitors can help explain their attitudes toward wilderness management. Thus, this study focused on three concepts:

1. Environmental Values—Nature can be seen to carry a number of values that may be of importance to humans. These values can be understood as the functions or products of nature from which humans derive material or non-material benefits. Examples include nature as a place for outdoor recreation and nature as a source of raw materials for economic development. Some values in nature accrue directly to individuals, while others are more indirectly diffused through society as a whole.

2. Environmental Ethics—It is inevitable that humans interact with nature. But what ideas govern or structure this interaction? What is the appropriate relationship between humans and nature, and how is this determined? For purposes of this study, environmental ethics are defined as...
the diversity of ideas that drive human-nature relationships. Examples include stewardship of nature as a religious duty and intrinsic rights of nature.

3. Attitudes Toward Wilderness Management—Wilderness management issues are diverse, and visitor attitudes toward management issues have been found to vary. Wilderness purism is a general concept used to characterize attitudes toward a variety of wilderness management issues (Hendee et al. 1968; Stankey 1972; Shafer and Hammitt 1995). Wilderness purism refers to the extent to which an individual's attitudes conform to principles highlighted in The Wilderness Act, such as naturalness, solitude, and lack of developed facilities and services. The concept of wilderness purism was used in this study as the focus of attitudes toward wilderness management.

**Study Objectives and Methods**

The overall purpose of this study is to empirically explore the relationship between the concepts described above. For example, what are the environmentally related values and ethics of wilderness visitors? Moreover, how are these values and ethics related to attitudes toward wilderness management? To answer these questions, three objectives were defined: (1) conceptualize and classify environmental values and ethics, (2) develop scales to measure environmental values and ethics, and (3) analyze relationships between environmental values and ethics and wilderness management.

There is a rich literature in history, philosophy, and a variety of environmentally related fields regarding environmental values and ethics. Much of this literature is reviewed in contemporary texts, including Bailes (1985), Callicott (1995), Des Jardins (1993), Elliot and Gare (1983), Glacken (1956), Hargrove (1989), Merchant (1993), Nash (1983; 1989), Petulla (1988), Simmons (1993), Taylor (1896), Rolston (1988), Van De Veer and Pierce (1994), Worster (1977, 1993), and Zimmerman (1993). Based on this literature, 11 potential values of wilderness were identified (see Table 1) and 16 environmental ethics were identified (see Table 2). The 16 environmental ethics were further classified into five broad categories. We do not necessarily suggest that these broad categories of ethics are ideas that are clustered together within segments of society; rather, they represent groups of ideas that we believe have some conceptual commonality.

The second study objective involved development of scales to measure the values and ethics outlined above. Values were measured with a battery of statements describing the 11 potential values of wilderness (see Table 1). To attain these values, respondents were asked to rate the degree of importance they attached to wilderness as a place. A six-point response scale was used, ranging from "not-at-all" to "extremely" important.

Ethics were measured by means of a battery of statements that attempted to capture alternative dimensions of each of the 16 environmental ethics. An 11-point response scale was used, anchored at "strongly agree" and "strongly disagree." An initial group of 104 statements was pretested on 150 undergraduate students who were asked to comment on any problems, ambiguities, or other difficulties in interpreting and responding to the statements. Based on this pretest, 62 statements were retained. Each environmental ethic was measured with statements rated on a 11-point scale anchored at "not-at-all" to "extremely." Both wilderness values and environmental ethics can be isolated and measured (and) are significantly related to wilderness purity.

### Table 1: Wilderness Values

<table>
<thead>
<tr>
<th>Value</th>
<th>Statement</th>
<th>Average Importance Rating</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aesthetic</td>
<td>Wilderness is a place to enjoy the beauty of nature.</td>
<td>5.55</td>
<td>0.78</td>
</tr>
<tr>
<td>Education</td>
<td>Wilderness is a place to learn how things are connected ecologically.</td>
<td>5.15</td>
<td>0.93</td>
</tr>
<tr>
<td>Recreational</td>
<td>Wilderness is a place to enjoy outdoor recreation activities.</td>
<td>5.07</td>
<td>0.97</td>
</tr>
<tr>
<td>Therapeutic</td>
<td>Wilderness is a place to regain and/or maintain one's health and mental well-being</td>
<td>5.07</td>
<td>1.12</td>
</tr>
<tr>
<td>Ecological</td>
<td>Wilderness is a place to protect the environment in order to ensure our own survival</td>
<td>4.56</td>
<td>1.42</td>
</tr>
<tr>
<td>Scientific</td>
<td>Wilderness is a place to conduct scientific studies of the natural environment.</td>
<td>4.44</td>
<td>1.22</td>
</tr>
<tr>
<td>Intellectual</td>
<td>Wilderness is a place to go to think because civilization cannot interrupt</td>
<td>4.34</td>
<td>1.43</td>
</tr>
<tr>
<td>Historical/cultural</td>
<td>Wilderness is a place that is important to the history of the country.</td>
<td>4.31</td>
<td>1.43</td>
</tr>
<tr>
<td>Moral/ethical</td>
<td>Wilderness is a place to express moral or ethical obligation to protect other living things</td>
<td>3.86</td>
<td>1.74</td>
</tr>
<tr>
<td>Spiritual</td>
<td>Wilderness is a place to get closer to God.</td>
<td>3.54</td>
<td>1.88</td>
</tr>
<tr>
<td>Economic</td>
<td>Wilderness is a place to get raw materials for society to grow in the future</td>
<td>2.38</td>
<td>1.38</td>
</tr>
</tbody>
</table>

*1 = "not at all important," 2 = "extremely important" 11-point response scale anchored at "not-at-all" to "extremely." Denotes statistically significant differences based on t-tests.

The third study objective was accomplished by means of a survey of wilderness visitors. The values and ethics scales were incorporated into a written questionnaire. In addition, a third battery of questions was developed to measure attitudes toward wilderness management. These questions were directed at the issue of wilderness purism as described earlier. A series of18 statements was constructed addressing selected management issues representative of wilderness purism. These statements are shown in Table 3. Respondents were asked the extent to which they agreed with each statement. An 11-point response scale was used, anchored at "strongly agree" and "strongly disagree." The questionnaire was administered by mail to a sample of 251 visitors to the Breadloaf Wilderness in Vermont, following procedures recommended by Dillman (1978). Sampling was con-
Study Findings

Wilderness Values—Visitors felt that wilderness is important for most of the values included in the study, and a clear hierarchy of values was identified (see Table 1). Direct use-related values, those that accrue more directly to individuals, tended to be rated as more important. These include aesthetic appreciation, education, outdoor recreation, and therapeutic values, which comprised the first two tiers of importance in Table 1. Less direct values, those that accrue less directly to individuals but more to society in general, constituted the third and fourth tiers of importance and included the values of ecological integrity to human survival, wilderness as a scientific resource, and wilderness as a historical/cultural resource. More abstract values of wilderness, including wilderness as an expression of moral/ethical obligation to nature and the spiritual value of wilderness, represented a fifth tier of importance. The economic value of wilderness as a source of raw materials was rated lowest in importance.

Environmental Ethics—Data from the 62 environmental ethics statements were factor analyzed to test the validity of the statements as measures of the 16 environmental ethics originally conceptualized. The relationship between these resulting 17 factors and the original 16 environmental ethics derived from the literature review is shown in Figure 1. The two lists of environmental ethics are very similar.

Responses to the statements comprising each environmental ethic factor were added to form an index score. Because factors contained unequal numbers of statements, these raw scores were standardized by transforming them back to the original 11-point response scale. These standardized index scores are graphed in Figure 2.

As with wilderness values, it is clear that wilderness visitors subscribed to a diversity of environmental ethics. Stewardship-based environmental ethics, particularly as they relate to duties to future generations and the general importance of nature, enjoyed especially strong support. Strong support for utilitarian conservation ethics, including quality of life, ecological survival, and efficiency was also pervasive across the sample. Radical environmental ethics, ideas that tend to challenge the traditionally anthropocentric western worldview regarding nature, also tended to be strongly embraced. Environmental ethics comprising the benign indifference and anti-environment categories were generally not supported, with the exception of some support for the view of nature as a storehouse of raw materials.

Wilderness Purity—Findings regarding wilderness purity are shown in Table 3. In some dimensions of wilderness purity, such as allowing snowmobiling and hunting, visitors strongly favored a high degree of wilderness purity. However, on other dimensions of wilderness purity, such as shelters and signs, a decidedly nonpurist attitude prevailed. Visitors to the Breadloaf Wilderness preferred an experience that has some elements of primitive or pure wilderness recreation and some elements of a more developed recreation experience.

To explore relationships between wilderness values, environmental ethics, and wilderness purity, multiple linear regression was employed. Respondent scores on the overall index of wilderness purity were used as the de-
except that these values may sometimes require or be enhanced by some manipulation or management of the environment.

Environmental ethics are more strongly related to wilderness purity, explaining approximately 25% of the variance in the overall wilderness purity index. Six of the 17 environmental ethics entered the equation. The more strongly respondents believed in the environmental ethics of animism, organismism, pantheism, humanitarianism, and threat to survival, the more purist their overall attitude toward wilderness management. The first two of these environmental ethics come from the radical environmentalism category, and their positive relationship with wilderness purity makes intuitive sense. The positive relationship between the threat to survival ethic and wilderness purity makes less intuitive sense, but is probably relatively unimportant as both the relationship and support for the ethic were weak. The more strongly respondents believed in the environmental ethics of religious stewardship, future generations, and human rights to use nature, the less purist their overall attitude toward wilderness management. These ethics come from the utilitarian conservation and stewardship categories and thus may imply more sympathy for human management of some elements of wilderness.

Finally, wilderness values and environmental ethics together explain approximately 37% of the variance in the overall index of wilderness purity. Ten values and ethics entered the equation, generally the same variables as outlined above.

### Conclusions and Implications

Several conclusions and implications might be drawn from this study. First, it is apparent that wilderness values and environmental ethics can be isolated and measured. Traditionally, such environmentally related values and ethics have been treated primarily at a conceptual level. However, these intellectual ideas can be defined more explic-
by, classified, and measured through scale development and associated survey and statistical techniques. While the values and ethics-related classification systems and measurement scales are subject to continued refinement, they suggest that an empirical approach to understanding these issues can be potentially productive and useful.

Second, the descriptive study findings provide some direct insights into environmentally related values and ethics that visitors bring with them to the wilderness. Visitors value wilderness for many reasons. Although more direct or individually related values, such as recreation, are rated as most important, less directly or more societally related values and more abstract values, such as ecological protection and expression of moral/ethical obligations, are also rated as important. In addition, visitors subscribe to a diversity of environmental ethics, including those that might generally be described as anthropocentric (including stewardship and utilitarian ethics) and biocentric (including radical environmental ethics).

Descriptive findings also provide insight into visitor attitudes toward wilderness management, especially as they relate to the issue of wilderness purism. Again, a diversity of attitudes was represented. Visitors to the Breadloaf Wilderness were strong wilderness purists with respect to some issues such as snowmobiling and hunting and were clearly not strong wilderness purists with respect to some other issues such as signs and shelters.

These descriptive findings suggest several wilderness management implications. Number one, more conflict over wilderness management may be inevitable. The diversity of wilderness values and environmental ethics found in this study suggests that wilderness is subject to multiple demands, and some of these demands may inherently conflict. For example, use of wilderness for recreation causes some ecological impact. This may in turn be antithetical to the value of wilderness as an expression of moral/ethical obligation to preserve nature or to the value of wilderness as a scientific resource. Similarly, the mix of anthropocentric and biocentric environmental ethics may present competing and potentially conflicting demands on wilderness management.

Number two, it may be wise for wilderness managers to be especially careful to prevent or minimize ecological impacts to wilderness. Many of the values of wilderness identified in this study are heavily dependent upon maintaining the ecological integrity of wilderness. Moreover, many of the environmental ethics identified are biocentric, future-oriented, and are highly dependent upon maintaining ecological integrity. While a number of values and ethics are more anthropocentric and utilitarian, these can and probably should be realized without threatening ecological integrity. In doing so, wilderness can best meet the multiple demands placed upon it by contemporary society.

Number three, wilderness managers probably should give more explicit attention to nonrecreation values. It is clear from study findings that visitors attain multiple values from wilderness, and that recreation is only one of many benefits. However, wilderness management is often focused primarily on recreation-oriented values (Manning 1992).

The third general conclusion to be drawn from this study is that values and

<table>
<thead>
<tr>
<th>Original Environmental Ethic Title</th>
<th>New Environmental Ethic Title</th>
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<tbody>
<tr>
<td>Threat to survival</td>
<td>Threat to survival</td>
</tr>
<tr>
<td>Spiritual evil</td>
<td>Spiritual evil</td>
</tr>
<tr>
<td>Storehouse of raw materials</td>
<td>Storehouse of raw materials</td>
</tr>
<tr>
<td>Religious dualism</td>
<td>Intellectual dualism</td>
</tr>
<tr>
<td>Anthropocentric Humanitarianism</td>
<td>Anthropeceentric Humanitarianism</td>
</tr>
<tr>
<td>Efficiency</td>
<td>Efficiency</td>
</tr>
<tr>
<td>Quality of life</td>
<td>Quality of life</td>
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<tr>
<td>Ecological survival</td>
<td>Ecological survival</td>
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<tr>
<td>Stewardship for future generations</td>
<td>Stewardship for future</td>
</tr>
<tr>
<td>Religious duty</td>
<td>Religious stewardship</td>
</tr>
<tr>
<td>Reverence for life-God’s creatures</td>
<td>Nature as spirit</td>
</tr>
<tr>
<td>Reverence for life-Mysticism</td>
<td>Importance of Nature</td>
</tr>
<tr>
<td>Humanitarianism</td>
<td>Humanitarianism</td>
</tr>
<tr>
<td>Animism/Organicism/Pantheism</td>
<td>Animism/Organicism/Pantheism</td>
</tr>
<tr>
<td>Liberalism-natural rights-Evolution</td>
<td>Natural rights</td>
</tr>
<tr>
<td>Liberalism-natural rights-Evolution</td>
<td>Humans in Nature</td>
</tr>
</tbody>
</table>

Figure 1. Relationships between the original 16 environmental ethics developed from the literature review and the 17 environmental ethics derived from the factor analysis.

Figure 2. Environmental Ethics Factors
ethics explained approximately 37% of the variance in respondent scores on the overall wilderness purity index. These statistical relationships show that beliefs in selected wilderness values and environmental ethics are associated with certain attitudes toward wilderness management. These types of relationships may help establish an empirical basis for a comprehensive wilderness management policy. For example, some wilderness areas may emphasize selected wilderness values and adopt associated management policies. This approach to management may allow wilderness managers to more effectively meet the diverse and sometimes competing values and ethics of wilderness visitors, while avoiding the potential conflict described above.

Although this study suggests several conclusions and implications, it has limitations as well. Data are drawn from visitors to only one wilderness area, so the degree to which study findings are generalizable is unknown. Moreover, the conceptualization and measurement of these concepts, wilderness values, environmental ethics, and attitudes toward wilderness management, are subject to continued refinement. Exploration of attitudes toward wilderness management was limited to issues related to wilderness purism. Finally, the study included only direct visitors to wilderness areas and other roadless areas. USDA Forest Service Research Paper INT-233.


REFERENCES


Lucas, R. 1980. Use patterns and visitor characteristics, attitudes, and preferences in nine wilderness

and other roadless areas. USDA Forest Service Research Paper INT-233.


