

Visitors' Knowledge of Federal Wilderness: Implications for Wilderness User Research and Management

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Abstract—Earlier research using interviews of backcountry hikers in Shenandoah National Park raised concerns that visitors may not know much about federal wilderness. This lack of knowledge has implications for research on wilderness experience and for support for wilderness management policies. In this study, self-assessed knowledge of wilderness, researcher-assessed knowledge, and knowledge filter questions were tested for their effectiveness in classifying wilderness knowledge; relationships between knowledge and attitudes toward management were also explored. More than 90% of hikers assessed themselves as having little or no knowledge of wilderness, and a researcher-assessed knowledge question confirmed that very few hikers were knowledgeable about federally designated wildernesses. Those with higher levels of knowledge tended to hold more “purist” views about management than those with less knowledge.

During interviews of backcountry and wilderness users in Shenandoah National Park (SNP) in the fall of 1997, it became obvious that Park visitors did not have a clear idea of what federally designated wilderness was and where it was located. When respondents were asked whether or not they had ever been to a federal wilderness, most (83%) answered affirmatively, but follow-up questions revealed that many respondents included national parks and nonwilderness areas. Only about 25% of the park visitors interviewed appeared to be truly knowledgeable about whether or not they had been to a federal wilderness area before.

This issue concerned us, because we felt that managers and researchers often assume that visitors share their highly developed comprehension of wilderness. Nearly all wilderness user studies ask questions about past use of wilderness, appropriate conditions in wilderness, or support for wilderness actions or policies. When questions ask specifically and only about the site where visitors are contacted, it may not matter that many do not know where wildernesses are or how they are managed. But when questions ask about generic “wilderness,” it may matter a great deal. We have little idea of whether respondents' answers are based on a clear conception of wilderness or whether they are

answering about their local state parks (or other areas), which they incorrectly believe to be wilderness.

Reviewing numerous wilderness visitor studies, we could find very few that asked a filter question about knowledge before they begin detailed questions about past use of wilderness, support for wilderness management policies or other issues. Almost none provided information about the National Wilderness Preservation System (NWPS) to respondents. If respondents and researchers have very different conceptions of what wilderness is and where it is located, inferences made from the results of these types of questions may be incorrect.

Such concerns led us to study the issue in more depth. To more clearly understand the wilderness experience levels and knowledge of Shenandoah backcountry visitors, we included several questions during research in 1998. We were interested in two questions. First, do SNP hikers know what federally classified wilderness is? We approached this issue using a self-report and a single objective measure. Second, do hikers who know more about federally classified wilderness differ in their opinions about wilderness management issues from hikers who know little or nothing?

Methods

Study Area and Sample Population

This research was conducted in Shenandoah National Park (SNP). This park contains nearly 80,000 acres of federally designated wilderness, established in 1976. There is also a large amount of undeveloped backcountry not legally classified as wilderness. Due to its close proximity to the Washington, DC, area and the popularity of the nationally known Skyline Drive and Appalachian Trail, the SNP backcountry receives one of the highest backcountry and overnight use densities in the national park system. There were an estimated 1.7 million backcountry visitors in 1995 (Shenandoah National Park 1998). Our study population was defined as all adult visitors (•16 years) to SNP backcountry and wilderness areas between May 10 and October 31, 1998.

Survey Development

To address our two research questions, several items were included in a mail survey sent to visitors contacted at SNP during 1998 as part of a backcountry visitor survey conducted for the Park. Previous interviews with SNP visitors had indicated that although many visitors seemed

In: Cole, David N.; McCool, Stephen F.; Borrie, William T.; O'Loughlin, Jennifer, comps. 2000. Wilderness science in a time of change conference—Volume 4: Wilderness visitors, experiences, and visitor management; 1999 May 23–27; Missoula, MT. Proceedings RMRS-P-15-VOL-4. Ogden, UT: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station.

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certain that they had been to a wilderness area before, others seemed to realize their knowledge limitations. Typical responses were: “not knowingly;” “uh, probably, yeah;” and “yeah, I believe so.” Others named a place they had been, but then followed up their response by asking the interviewer if that was a wilderness area. Therefore, one survey question in this study asked visitors to indicate how familiar they felt they were with the legal definition of wilderness (table 1). This question appeared in a section prefaced by the following statement. “Over the past 35 years, Congress has passed legislation creating a system of federally designated wilderness areas on public lands in the United States. We are interested in whether the legal

definitions are consistent with visitors’ ideas about what wilderness is and should be.” The first questions (not reported here) asked about “your personal sense or definition of wilderness—what “wilderness” means to you,” including items about best example and characteristics of wilderness. The question reported here followed those questions, and asked “How familiar are you with the legal definition of wilderness?” Because the majority answered, and because many gave responses showing they were uncertain, we believe visitors are able and willing to assess their own knowledge level.

Data from the self-assessment provided one measure of knowledge. As a check on its validity, respondents who said

Table 1—Survey questions addressing knowledge of wilderness.

How familiar are you with the legal definition of Wilderness?

- I have no idea—I didn’t even know there was a land classification of “Wilderness.”
- I have heard of Wilderness areas, but I don’t know anything about the specific definition.
- I know a little bit about what legally classified Wilderness is.
- I think I know a lot about the legal definition of Wilderness.

Please list the three most recent wilderness areas (other than in Shenandoah) that you have visited.

How often do you usually take wilderness trips? (Mark one.)

- I’ve never been to a wilderness.
- I don’t know what wilderness is, so I don’t know if I’ve been or not.
- Less than once every 2 years
- Less than once a year
- Once a year
- 2-5 times a year
- 6-10 times a year
- More than 10 times a year

The following is a list of policies that could be adopted for wilderness areas. Please indicate the extent to which you agree or disagree with each statement as a general policy for federal wildernesses in the United States. Please answer even if you are not sure about the legal definition of wilderness.

	Strongly agree	Agree	No opinion	Disagree	Strongly disagree
People should be allowed to carry cellular phones into the wilderness to use in case of an emergency.	+2	+1	0	-1	-2
People should not be allowed to carry cellular phones into the wilderness because technology detracts from the wilderness experience.	+2	+1	0	-1	-2
Trails in wilderness areas should be almost nonexistent, only blazed or marked routes.	+2	+1	0	-1	-2
Trails in wildernesses should be of varied type and quality in different places, to satisfy varied interests.	+2	+1	0	-1	-2
All wilderness trails should be improved and well-maintained.	+2	+1	0	-1	-2
There should be no trails, and no other human influence at all in wildernesses.	+2	+1	0	-1	-2
Moderate improvement of wilderness campsites is desirable (e.g., removing brush and limbs, putting nails in trees for utensils, simple box cupboards, etc.)	+2	+1	0	-1	-2
Lightning-caused fires in wilderness should be allowed to burn.	+2	+1	0	-1	-2
Places in wilderness denuded by fire, insects, or disease should be protected by replanting vegetation.	+2	+1	0	-1	-2
Heavy infestations of native insects in wilderness should be allowed to run their course.	+2	+1	0	-1	-2
Hunting should be forbidden in wilderness areas.	+2	+1	0	-1	-2
Wilderness managers should be allowed to use chainsaws to clear debris from wilderness trails.	+2	+1	0	-1	-2
Wildernesses should have few rules and regulations to ensure visitor freedom.	+2	+1	0	-1	-2
Mountain bikes should be allowed in wilderness areas.	+2	+1	0	-1	-2

that they had been to a wilderness before were asked to list the three most recent wilderness areas they had visited. (This question was in a section about “use of wilderness areas in the United States” and did not specify “legally classified.” We believe that the prior questions about knowledge of legal wilderness probably cued respondents to be thinking of federal wilderness, but it is possible that they had a different idea in mind.) For analytic purposes, the areas respondents listed were sorted into three categories. If a respondent correctly listed federal wildernesses, and only federal wildernesses, they were classified as “knowledgeable.” Those who listed no federal wilderness areas were classified as “unaware.” Those who listed some wildernesses and some nonwilderness areas were classified as “mixed.” In this process, we opted to code ambiguous areas generously. For example, “Mount Rainier”—which has both wilderness and nonwilderness—was coded as a wilderness, even though the respondent might not be thinking about the wilderness portion of the park when answering. However, *de facto* wilderness areas, such as the Yellowstone backcountry or the Grand Canyon, were coded as incorrect because they do not contain federally designated wilderness.

Another question asked about respondents’ use of wilderness, using common categories for the frequency of trips. This question enabled us to discern how many respondents will answer such a question even if they themselves do not think they know what a wilderness is. (This item was in the same section as the previous question about most recent wilderness visits, and did not specifically instruct them to answer for “legally classified” wilderness.) We included a novel option in this question: “I don’t know what wilderness is, so I don’t know if I’ve ever been or not.” We wondered if respondents who, in a prior question had indicated knowing nothing about wilderness, would select this option.

To test whether respondents with different levels of knowledge differed in their opinions on wilderness management, a set of 14 policy items was presented. Respondents were asked to indicate how much they personally agreed or disagreed with each item as a general policy for federal wildernesses in the United States, regardless of whether or not they were sure about the legal definition of wilderness.

Survey Administration

On randomly sampled days between May and October 1998, all visitors entering or exiting 23 sample trailheads were contacted and asked to complete a short contact sheet. In order to increase our sample of overnight users, visitors seeking backcountry camping permits at entrance stations and visitor centers were also asked to complete the short on-site survey during sample periods. Data were obtained for

approximately 2,400 visitors (1,620 day and 782 overnight). Following the Dillman (1978) method, mail surveys were sent to those who had provided names and addresses (n = 1,660). After a postcard reminder and a second survey mailing, 856 usable surveys were returned, for a response rate of 51%.

Results

Self-Assessed Wilderness Knowledge

Responses to the self-assessment of knowledge revealed that the vast majority of users (>90%) believed that they knew at best only a little about what legally classified wilderness is (table 2). Most had only heard the term.

SNP visitors clearly do not feel they are very knowledgeable about federal wilderness, but this did not prevent them from answering the question about how often they usually take wilderness trips. Only 3% volunteered that they had never been to a wilderness area before, and in the filter response category only 10% said that they did not know what wilderness was, so they could not say whether or not they had been to one (table 3). Twenty percent indicated that they typically take more than six trips per year to wilderness areas. If people do not know what a wilderness area is and consider any state park or national park to be wilderness, this could be a gross overestimation of their actual number of trips to wilderness.

It is of particular concern that even those visitors who tell us that they know nothing about wilderness will answer such questions. Only 18% of this group selected the filter option we expected them to mark. Almost 75% reported some frequency of wilderness trips. Thus, we cannot expect those who do not understand the intent behind questions about wilderness to leave such items blank. This finding is consistent with a large body of public opinion research that has found that people will answer questions even about issues of which they have little or no knowledge (Bishop and others 1986; Hippler and Schwarz 1989; Schuman and Presser 1980).

Researcher-Assessed Knowledge

Self-reports are only one measure of knowledge. To further understand whether SNP hikers know what wilderness is, those who reported having made a wilderness trip in the previous question were asked to name the three most recent wilderness areas they had visited. As discussed previously, the responses were coded as knowledgeable (named only units of the NWPS), mixed (named at least one wilderness and one nonwilderness) and unaware (named only nonwilderness areas). It is important to note that the question

Table 2—Self-assessed knowledge of federal wilderness among SNP hikers.

Self-assessed wilderness knowledge	Percent
I have no idea—I didn’t even know there was a land classification of “wilderness.”	9.8
I have heard of Wilderness areas, but I don’t know anything about the specific definition.	51.3
I know a little bit about what legally classified Wilderness is.	31.5
I think I know a lot about the legal definition of Wilderness.	7.4

Table 3—Frequency of wilderness visitation as reported by visitors with different self-assessed levels of wilderness knowledge.

Frequency of wilderness visitation	Self-assessed wilderness knowledge				
	Total	High	Little	Heard of	No idea
	-----percent-----				
I've never been to a wilderness.	3.4	0.0	2.4	3.0	9.6
I don't know what a wilderness is.	9.8	0.0	3.2	14.2	17.8
Less than 1 trip every 2 years.	7.5	0.0	4.0	9.7	12.3
Less than 1 trip every year.	5.4	5.1	6.4	4.7	4.1
1 trip per year.	16.5	13.6	20.1	14.7	19.2
2-5 trips per year.	36.9	35.6	40.6	36.8	24.7
6-10 trips per year.	11.1	28.8	12.1	8.7	6.9
More than 10 trips per year.	9.4	17.0	11.2	8.2	5.5

Chi-square test, $p < 0.0005$.

asked “about your use of wilderness areas in the United States” without specifically denoting units of the NWPS. Thus, some respondents may have reported based on their personal idea of what is wilderness. However, because an earlier question informed visitors that there is a federal system of wilderness, we believe this is what they had in mind when answering.

By this classification, only 13% of these respondents were judged knowledgeable (table 4). Forty-one percent responded by naming at least one wilderness area and one nonwilderness area, and 46% named only areas which were not wilderness. Generous classification of ambiguous cases (generally national parks) as wilderness means that these figures probably overestimate the number of people who actually visited federal wilderness areas.

Next, we explored the relationship between our classification and respondents' self-assessed level of knowledge. For analysis, respondents who indicated that they didn't know how many trips they had taken to wilderness because they didn't know what wilderness was (10% of respondents) were included in the “unaware” category.

There is a clear relationship between the two measures, particularly for those low in knowledge. Of some concern is the small percentage (25%) of those claiming high knowledge who accurately named wilderness areas (table 5). However, over 75% of this group named at least one wilderness area, which is much higher than the rate among visitors who indicated they had less knowledge. We classified only 3% of those with low self-assessed knowledge as knowledgeable. These data suggest that people who say they don't know what wilderness is in fact do not, but that a portion of those who say they know a lot do not appear to know as much as they think.

Table 4—Researcher-assessed knowledge of SNP visitors who reported taking a wilderness trip.

Researcher-assessed knowledge	Percent
Knowledgeable	13.2
Mixed	41.0
Unaware	45.8

Management Opinions

It is clear from the mail survey and interviews that most SNP hikers do not know which management units or locations are wilderness, but what does this mean? Are there management or research implications? To investigate this issue we used respondents' self-assessed knowledge levels to compare opinions about different management issues. We used the self-assessed knowledge instead of our classification because the two measures were highly correlated, and because coding was less problematic. (For example, many respondents named *de facto* wilderness areas—which may demonstrate their knowledge of the concepts behind the legal definition of wilderness—but were coded in our classification as nonwilderness.)

For all but two of 14 wilderness management policy items, those who are more knowledgeable about wilderness have different views about appropriate wilderness management than those who know little about wilderness (table 6). In several cases, the differences are quite pronounced. Interestingly, in every case, those who profess higher knowledge hold opinions that are most consistent with a “purist” orientation and the Wilderness Act. For example, they are least supportive of allowing cellular phones, chainsaws or improved campsites, and most supportive of allowing natural processes to operate or prohibiting mountain bikes in wilderness.

Discussion

Management Implications

We found that less than half of the people we contacted in Shenandoah National Park named a federal wilderness

Table 5—Relationship between self- and researcher-assessed knowledge of wilderness.

Researcher-assessed knowledge	Self-assessed knowledge classification			
	High	Little	Heard of	No idea
	-----percent-----			
Knowledgeable	25.0	14.7	9.1	3.3
Mixed	51.8	43.8	30.1	31.2
Unaware	23.2	41.5	60.8	65.6

Chi-square test, $p < 0.0005$.

Table 6—Mean level of agreement with wilderness management policies.¹

Wilderness management policies ²	Self-assessed knowledge				p ³
	High	Little	Heard of	No idea	
People should be allowed to carry cellular phones for an emergency.	0.3 ^a	0.7 ^b	1.0 ^c	1.2 ^c	0.000
People should not allowed to carry cellular phones because technology detracts from the wilderness experience.	-0.2 ^a	-0.6 ^b	-0.9 ^{bc}	-1.0 ^c	0.000
Wilderness trails should be almost nonexistent.	0.3 ^a	0.3 ^a	0.0 ^a	-0.5 ^b	0.000
Trails should be of varied type and quality in different places to satisfy varied interests.	0.3 ^a	0.7 ^b	1.0 ^c	1.3 ^c	0.000
All wilderness trails should be improved and well-maintained.	-0.8 ^a	-0.5 ^a	-0.2 ^b	0.2 ^c	0.000
There should be no trails, and no other human influence at all in wilderness.	-0.4 ^a	-0.7 ^b	-0.9 ^b	-0.9 ^b	0.001
Moderate improvement of wilderness campsites is desirable.	-0.9	-0.6 ^{ab}	-0.3 ^{bc}	-0.1 ^c	0.000
Lightning-caused fires should be allowed to burn.	0.7 ^a	0.4 ^b	0.0 ^c	0.0 ^c	0.000
Places denudes by fire or insects should be protected by replanting vegetation.	-0.6 ^a	0.0 ^b	0.2 ^b	0.2 ^b	0.000
Heavy infestations of insects should be allowed to run their course.	0.6 ^a	0.4 ^{ab}	0.2 ^b	0.2 ^b	0.034
Hunting should be forbidden in wilderness.	0.8 ^a	0.9 ^a	0.7 ^a	1.0 ^a	0.123
Managers should be allowed to use chainsaws to clear debris from wilderness trails.	0.1 ^a	0.5 ^b	0.7 ^{bc}	0.9 ^c	0.000
Wildernesses should have few rules and regulations to ensure visitor freedom.	-0.4 ^a	-0.6 ^a	-0.6 ^a	-0.4 ^a	0.419
Mountain bikes should be allowed in wilderness areas.	-1.0 ^a	-0.8 ^{ab}	-0.5 ^b	-0.5 ^b	0.001

¹Scale +2 = strongly agree, -2 = strongly disagree.

²Complete wording of items is found in table 1.

³ANOVA, Duncan's *post hoc* comparisons. Values with different superscripts are significantly different at the .05 level.

when asked to report wildernesses they had visited. We believe this means that many do not know where federal wilderness is. (However, our question wording was not as precise as desirable to be fully confident of this conclusion; some people may not have been clear that this question asked specifically about federally classified wilderness.) The indication that a relatively large percentage of people do not know whether they have been to a wilderness area has implications concerning the many wilderness studies that ask about past wilderness experience. Our findings suggest that results from such questions may not validly measure the constructs researchers intend them to measure: Respondents may be including a wide range of areas when describing past experience. Managers might conclude that their visitors are experienced, and therefore knowledgeable about policy, behavior or regulations, when in fact they are not.

Furthermore, we should be skeptical when interpreting any responses about “wilderness” use and experience in studies where wilderness is not clearly defined for or by the respondents. It is usually not possible to discriminate between the valid/informed responses and invalid/uninformed responses. This could pose special problems when comparing past experience measures (or other wilderness-related variables) from different areas (some of which may have knowledgeable respondents and some of which may not).

There are also implications for management if respondents think everything, from the Bob Marshall to their local state park is Wilderness, because they may respond differently to proposed actions such as use limits or camping restrictions. For example, our study asked whether respondents support prohibiting camping in some parts of wilderness or requiring permits to enter wilderness. These questions were phrased for “federal wilderness areas in general.” Some visitors (and perhaps a larger percentage of low-knowledge visitors) may

oppose such actions, believing that they are not appropriate for the local state park (to which they think we are referring). They might, on the other hand, be more apt to think such actions would be appropriate if they understood the location, extent and purpose of the NWPS.

This possibility leads naturally to a discussion of the role and merits of wilderness education. Clearly, there is room for improvement in conveying why and where the NWPS exists. There is also a very intriguing relationship between wilderness knowledge and level of support for actions consistent with the Wilderness Act. We did not suspect *a priori* that knowing about wilderness would entail supporting purist wilderness management policies, but this clearly seems to be the case for SNP hikers.

Proposed Solutions for Research Efforts

At a minimum, researchers should use a filter question to assess wilderness knowledge. However, not many respondents selected our filter question, and those who did not were mostly incorrect in naming a wilderness area. Thus, we recommend using a self-assessment measure of wilderness knowledge. We have found the particular measure we used generates different distributions in different settings, and thus seems to have one of the discriminatory properties desirable of survey questions. For example, among Grand Canyon commercial boaters, 46% said they had never heard of wilderness (vs. 10% at SNP). Among private boaters in the Grand Canyon, 77% said they know a little or a lot about wilderness (vs. 38% at SNP). Furthermore, this self-assessment was well correlated with our single objective measure of knowledge, although we would welcome additional tests of its validity.

If it is crucial for the researcher to know whether respondents are truly knowledgeable, questions to test knowledge should be used as a validity check. Our measure—having respondents list wildernesses—was useful, but also problematic, primarily because many respondents listed national parks that have wilderness, and we could not tell whether they were aware of or thinking about the wilderness portions of these parks. For this reason, we suggest also asking about specific management policies in wilderness. These questions should test knowledge of wilderness principles such as the prohibition on motorized vehicles. Examples could include: Are cars allowed in wilderness areas? Are mountain bikes allowed in wilderness areas? Other questions might probe the respondents' knowledge of distinctions between land classifications, because it is clear that many SNP hikers were confused about the differences between national parks and wilderness areas.

If a manager is seeking to understand support for proposed policies, he or she should be clear about where those would be implemented. Ideally, respondents would be informed of the

geographical scope of such policies before asking opinions, so that they would understand they are not being proposed (for example) for all national parks. Future research is needed to show if such education would affect opinions on wilderness management.

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