Chapter 14: Wildland Recreationists' Natural Resource Management Purposes and Preferences: A Connection to Environmental Identity

Patricia L. Winter[1] *and Deborah J. Chavez*[1]

Abstract

Wilderness and day use recreationists' preferences for natural resource management and their perceptions of purposes for management are examined in this paper. Environmental identity (EID) salience is used to help shed light on variations in recreationists' preferences for how natural resources should be managed. Findings from two studies are reported; the first was from a survey of urban-proximate wilderness visitors, the second from visitors to day use areas. Both studies were conducted on national forest lands. The two studies incorporated similar items to allow comparisons. In both cases, recreationists were asked to evaluate the relative importance of natural resource areas for low-impact recreation opportunities, high-impact recreation opportunities, and for environmental protection purposes. In addition, they were asked to indicate if more, less, or the same amount of area should be set aside for each of these purposes. Strong support for environmental protection purposes was found in both studies. Support for additional areas allocated to environmental protection and low-impact recreation was also found, particularly among the day users. Our findings indicate that management of recreation opportunities can include considerations of sustainability as important to recreationists. Environmental identity seemed helpful in understanding management preferences in that significant relationships between high environmental identity and support for natural resource protection were revealed. The EID scale worked well among White respondents as well as among groups of color. The environmental identity construct may be of assistance in furthering our understanding of land management preferences and provides an additional point of context beyond place attachment.

Keywords: Environmental identity salience, management preferences, recreationists.

[1] Winter is a research social scientist and Chavez is a supervisory social scientist, U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station, Wildland Recreation and Urban Cultures Research Unit, 4955 Canyon Crest Drive, Riverside, CA 92507-6099; e-mail: pwinter@fs.fed.us, dchavez@fs.fed.us.

Introduction

Dunlap (1992) documented the environmental movement's success in gaining public attention and support to address ecological problems. However, the gap between this expressed concern and actual social change to solve major environmental problems remains (Dunlap 1992). A number of factors influence individual action and help explain the gap between environmental attitudes and behaviors (Ajzen 1988, Gardner and Stern 1996, Nickerson 2003). A strong relationship between attitudes and behaviors exists when attitudes are based in knowledge, are clear, and are developed through direct experience with the attitude object (Zimbardo and Leippe 1991).

A newly emerging approach to the question of understanding environmental responsibility is the inquiry into environmental identity. Clayton (2003) has discussed environmental identity as part of a person's self concept derived from their connection to the natural world. The Environmental Identity (EID) salience scale was created to assess the role that the natural environment might play in a person's self-definition (Clayton 2003). Linking environmental behaviors to (EID) salience moves beyond an assessment of general attitudes and toward the centrality of an individual's attitudes about the environment in their daily lives. In essence, the scale determines how connected to the natural environment an individual perceives herself to be. EID might shed light on variations in environmental behaviors and choices that impact the natural environment. Environmental identity was significantly correlated with ecocentrism (the perspective that the natural environment is of primary concern) as well as environmental behaviors during scale development (Clayton 2003).

The Present Study

A study was conducted involving visitors to urban-proximate federally designated wilderness areas and day-use areas to examine natural resource management perceptions and preferences. The goal was to ascertain the purposes these visitors felt were most important for natural resource areas. Additionally, we wanted to know whether or not the current amount of area for those purposes was viewed as adequate. We aimed to inform decisionmaking in an area not currently open to recreation–the San Dimas Experimental Forest. The experimental forest is located in a large urban area and may hold many interests for that surrounding population. Knowing what recreationists visiting surrounding forests view as important purposes for management, as well as knowing perceived need for areas for various purposes, can help inform choices about what San Dimas will be managed for beyond its continuing role as an experimental forest.

A modified version of the EID scale was used in a survey of visitors on national forest lands. Two studies are reported, the first conducted with urban-proximate wilderness visitors and the second with visitors to dayuse areas. Selected comparable items are reported for the purpose of understanding the relationship between EID and recreationists' management preferences.

Methods

Procedure for Study 1

Visitors appearing to be age 16 or older intercepted at selected wilderness trailheads on summer weekends and week days were invited to participate in a brief survey. The final onsite survey items were an invitation to participate in a mailed survey, with a request for a mailing or e-mail address. Respondents were also asked to indicate whether they would prefer an English or Spanish version of the mailed survey. Each respondent who volunteered to complete the mailed survey received one, according to their expressed preference. Mailings followed a modified Dillman procedure, with an initial mailing, a postcard reminder 10 days later to nonrespondents, and later a second mailing of the full survey to nonrespondents. Response rate for the wilderness onsite survey was 43.0 percent, and of those, 58.2 percent agreed to participate in the mailed survey; 28.0 percent of the original respondents completed the mailed survey.

Respondents for Study 1

The onsite survey was completed by 368 respondents, most of whom were male (66.0 percent) and had graduated from college (54.0 percent). Most were White (58.0 percent), although 14 percent of respondents were Hispanic, 9 percent were Asian, and 10 percent identified with multiple ethnicities. A subset (n = 103) of the onsite wilderness survey respondents completed the mailed survey and was similar to the onsite respondents, although a greater percentage was White.

Procedure for Study 2

Visitors appearing to be age 18 or older encountered at selected day-use locations were invited to complete a self-administered survey. Selected locations included picnic areas, trailheads, open space areas, an off-highway vehicle staging area, and a Forest Service visitor center located in San Gabriel and San Antonio Canyons on the Angeles National Forest. The response rate in this survey was 56.0 percent.

Respondents for Study 2

A total of 509 forest day users completed the survey. Most respondents were male (62.5 percent), Hispanic (55.0 percent), and had completed at least 1 year of college (56.1 percent).

Surveys

In both studies, the surveys were available in both English and Spanish. The Spanish versions were verified through back translation using an alternate translator. Two surveys were used in study 1. The onsite wilderness survey was brief and included items asking about recreation visitation, who respondents were recreating with, activities engaged in, and sociodemographics. The mailed wilderness survey and the onsite day-use survey asked for what purposes public lands should be managed (such as recreational uses or environmental protection, shown in the following list).[2]

It is important to manage natural areas for:

- Environmental protection (6 items)
  - Improved air quality
  - Long-term study of the relationships between weather, fire patterns, plants, animals, and soils
  - Protection of plants
  - Protection of water quality
  - Protection of wildlife
  - Scenic value
- Low-impact recreation (10 items)
  - Camping
  - Day hiking
  - Educational purposes
  - Sightseeing
  - Snow play
  - Stream play
  - Swimming
  - Watching wildlife
  - Picnicking at developed sites (with grills/tables/toilets)
  - Gathering (of minerals, plants, and other items for recreational purposes)
- High-impact recreation (4 items)
  - Horseback riding
  - Mountain bike riding
  - Off-highway vehicle riding
  - Fishing

[2] Rated on a scale from 1 to 5 where 1 = strongly disagree, 3 = neither, and 5 = strongly agree.

Twenty purposes for natural resource management were queried. The items were combined in three subscales representing environmental purposes (PURENV, 6 items), low-impact recreation purposes (PURRECLO, 10 items), and high-impact recreation purposes (PURRECHI, 4 items, table 14-1). Respondents were also asked their opinions about the amount of areas available for each purpose (using the same list provided for management purposes). Respondents could indicate that there should be less (-1), the same (0), or more (+1) area. Items were combined in three comparable subscales, representing the sum of the items (AMTENVSUM-measuring the amount of areas for environmental purposes, 6 items, AMTRECLOSUM-measuring the amount of area available for low-impact recreation uses, 10 items, AMTRECHISUM-measuring the amount of area available for high impact recreation uses, 4 items, table 14-2).

Table 14-1—Land management purposes subscales

Study	Subscale[a]	α[b]	Mean	n
1	PURENV	0.92	4.67	102
	PURRECLO	.85	4.45	102
	PURRECHI	.76	3.89	102
2	PURENV	.89	4.52	498
	PURRECLO	.90	4.38	500
	PURRECHI	.76	3.71	488

[a] PURENV measures support for management of natural areas for environmental protection purposes, PURRECLO for low-impact recreation purposes, and PURRECHI for high-impact recreation purposes.
[b] Chronbach's alpha reliability for each subscale.

Table 14-2—Amount of area subscales

Study	Subscale[a]	α[b]	Mean	n
1	AMTENVSUM	0.87	3.35	99
	AMTRECLOSUM	.87	3.81	98
	AMTRECHISUM	.76	-.33	83
2	AMTENVSUM	.87	4.25	481
	AMTRECLOSUM	.88	5.77	486
	AMTRECHISUM	.77	1.01	474

[a] AMTENVSUM measures the amount of area desired for environmental purposes, AMTRECLOSUM for low-impact recreation purposes, and AMTRECHISUM for high-impact recreation purposes.
[b] Chronbach's alpha reliability for each subscale.

In addition to these questions about management, a modified version of the EID scale was included (table 14-3) to assess respondents' connection to nature. This modification involved a reduction in the number of items and a minor re wording of one item. Modification was necessary to reduce respondent burden and add clarity for a diverse recreating public. Responses on management purposes and the EID scale were then compared among groups (wilderness vs. day use, Whites vs. non-Whites) and examined for their relationship to each other.

Table 14-3—Environmental identity scale

Environmental identity (EID) scale item[a]	Study 1 wilderness users[b] Mean (N, SD)	Study 2 day users Mean (N, SD)
I spend a lot of time in natural settings (woods, mountains, desert, lakes, ocean).	5.91 (101, 1.29)	5.01 (494, 1.83)
I think of myself as part of nature, not separate from it.	5.76 (101, 1.45)	5.13 (485, 1.77)
When I am upset or stressed, I can feel better by spending time outdoors "communing with nature."	6.25 (102, 1.25)	5.81 (494, 1.55)
I have a lot in common with environmentalists as a group.	5.03 (101, 1.68)	4.53 (483, 1.85)
I believe that some of today's social problems could be cured by returning to a more rural life-style in which people live in harmony with the land.	4.91 (101, 1.96)	5.00 (495, 1.88)
Learning about the natural world should be an important part of every child's upbringing.	6.54 (102, 0.88)	6.07 (492, 1.33)
I really enjoy camping and hiking outdoors.	6.73 (102, 0.60)	6.11 (485, 1.36)
Sometimes I feel like parts of nature–certain trees, or storms, or mountains—have a spirit of their own.	4.82 (102, 2.09)	4.98 (490, 1.98)
I would feel that an important part of my life was missing if I were not able to get out and enjoy nature from time to time.	6.53 (102, 1.10)	5.91 (490, 1.49)
I have never seen a work of art that is as beautiful as a work of nature, like a sunset or mountain range.	5.69 (102, 1.80)	5.68 (490, 1.65)
EID average score[c]	58 (102, 9.52)	53.25 (499, 12.23)

[a] Adapted from Clayton (2003). Rated on a 1 to 7 scale, where 1 = not at all true of me, 4 = neither true nor untrue, and 7 = completely true of me.

[b] Study 1 respondents rated all EID items higher on average with the exception of two items: "I believe that some of today's social…" and "Sometimes I feel like parts of nature…"

[c] Is the average sum across all respondents on the EID scale.

Results

Public Land Management Purposes

The environmental purpose subscale was assigned the highest ratings among the three purposes in both studies, indicating agreement that natural resource areas should be managed for environmental protection purposes, with low-impact recreation purposes second in priority ratings.

The ratings on these subscales were also examined to contrast Whites with groups of color. Although we recognize that people of color are not homogeneous in their perspectives toward land management, we had limited numbers of respondents within the various ethnic/racial categories; therefore, all people of color were considered as one group. No significant differences were found in land management purposes in study 1 by ethnic/racial group (*t*-tests, $p > 0.05$, table 14-4).

Table 14-4—Management purposes and amount of areas needed for each purpose by Whites and people of color

Study	Subscale		Mean	n	t_{df}	*p*
1	PURENV	Whites	4.63	82		
		Non-Whites	4.79	20	1.07_{100}	0.29
	PURRECLO	Whites	4.40	82		
		Non-Whites	4.65	20	1.55_{100}	.12
	PURRECHI	Whites	3.84	82		
		Non-Whites	4.07	20	$.91_{100}$	.37
	AMTENVSUM	Whites	3.70	80		
		Non-Whites	4.28	18	$.98_{96}$	.33
	AMTRECLOSUM	Whites	2.88	81		
		Non-Whites	5.50	18	2.79_{97}	< .01
	AMTRECHISUM	Whites	-.46	76		
		Non-Whites	.24	17	1.36_{91}	.18
2	PURENV	Whites	4.60	162		
		Non-Whites	4.46	296	-1.88_{389}	.06
	PURRECLO	Whites	4.27	162		
		Non-Whites	4.43	297	2.21_{457}	.03
	PURRECHI	Whites	3.42	162		
		Non-Whites	3.85	287	4.15_{447}	< .01
	AMTENVSUM	Whites	4.32	158		
		Non-Whites	4.17	285	$-.69_{441}$	.49
	AMTRECLOSUM	Whites	4.96	159		
		Non-Whites	6.20	288	3.49_{445}	< .01
	AMTRECHISUM	Whites	.28	155		
		Non-Whites	1.35	282	5.65_{435}	< .01

Sufficient numbers of respondents in study 2 facilitated comparisons (maximum of 297 people of color and 162 Whites). People of color rated low-impact recreation purposes higher on average than did Whites (PURRECLO, table 14-4). They also assigned higher priority to high-impact recreation purposes (PURRECHI, table 14-4). Ratings on environmental purposes (PURENV) were not significantly different.

Amount of Area

In study 1 we found that the greatest support of wilderness respondents was for additional areas for environmental purposes, followed by low-impact recreation purposes. In study 2, we found some similarities to study 1, in that increase in the amount of area for environmental purposes was most supported by day users, followed by amount of area for low-impact recreation

To compare support for amount of each type of area, we divided the sum of area ratings within each subscale by the number of items (to standardize the scores). In study 1 we found through this step in the analysis that the greatest support of wilderness respondents was for additional areas for environmental purposes (mean = 0.63, SD = 0.38, n = 98), followed by low-impact recreation purposes (mean = 0.33, SD = 0.37, n = 99). The overall trend was for a reduction of areas for high-impact recreation among the wilderness visitors surveyed (mean = -0.08, SD = 0.48, n = 93). In study 2, we found some similarities to study 1, in that increase in the amount of area for environmental purposes was most supported by day users (mean = 0.71, SD = 0.36, n = 481), followed by amount of area for low-impact recreation (mean = 0.58, SD = 0.36, n = 486). Although least supported, a marginal addition to high-impact recreation areas was the outcome for the day users surveyed in study 2 (mean = 0.25, SD = 0.49, n = 474).

Similar to our examination of land management purposes, we examined ratings on each of these subscales for amount of area contrasting Whites and groups of color by using *t*-tests. For study 1, we found that people of color were more likely than Whites to agree that more areas were needed for low-impact recreation (AMTRECLOSUM). No other differences were significant (again, the low numbers of respondents constrained these tests). In study 2, respondents of color were more likely than Whites to indicate that more areas were needed for both low- and high-impact recreation (AMTRECLOSUM and AMTRECHISUM, table 14-4). No differences were found when we compared Whites and people of color on amount of area needed for environmental purposes.

For study 2, we found that people of color were significantly more supportive of additional areas for both low- and high-impact recreation opportunities (AMTRECLOSUM and AMTRECHISUM) when compared to Whites. No significant differences were found in levels of support for additional areas for environmental protection.

Environmental Identity Scale

The modified EID scale (adapted from Clayton 2003) showed some similarities and differences between the two studies' respondents (table 14-3). With the exception of two items, study 1 respondents indicated greater agreement with the individual statements than did study 2 respondents, suggesting that wilderness users perceived a stronger connection to nature. Both groups were equally likely to agree that they had not seen a work of art as beautiful as nature.

The EID score—

EID score was calculated from the mean of responses to the items within the scale. The EID items fit together reliably as a scale (EID study 1 $\alpha = 0.84$; EID study 2 $\alpha = 0.88$). EID score was higher for the wilderness visitors than it was for day users (table 14-3). Average EID score was not significantly different when comparing Whites and people of color from study 1; however, it was significantly higher for Whites in study 2, where Whites had a higher EID score, suggesting a stronger connection to nature.

Environmental Identity Score and Purposes

In study 1, respondents' EID scores were significantly and positively correlated with managing for environmental purposes (PURENV, $r = 0.24$, $p < 0.05$), and with amount of area needed for environmental protection (AMTENVSUM, $r = 0.30$, $p < 0.01$). The EID score was not correlated with ratings of managing public lands for low- or high-impact recreation purposes, or with ratings on need for area (more or less) for low- or high-impact recreation.

In study 2, EID scores were significantly and positively correlated with managing for environmental purposes (PURENV, $r = 0.40$, $p < 0.01$), managing for low-impact recreation management purposes (PURRECLO, $r = 0.28$, $p < 0.01$), need for more areas for environmental protection (AMTENVSUM, $r = .026$, $p < 0.01$), and need for more areas for low-impact recreation (AMTRECLO, $r = 0.11$, $p = 0.01$). The EID score was not correlated with ratings on managing public lands for high-impact recreation purposes, or with ratings on amount of area needed for high-impact recreation.

Using a median-split score for each EID revealed a significant difference between respondents with low and high EID scores in study 1. Among those with higher EID scores, greater agreement with importance of environmental purposes was found (PURENV, low EID average = 4.53, high EID average = 4.80; $t = -2.37$, $p = 0.02$). In addition, we found greater support for additional areas for environmental protection (AMTENVSUM, low EID average = 3.10, high EID average = 4.51;

t = -3.24, $p < 0.01$). Other differences between those with low and high EID scores were not significant.

In study 2, those with higher EID scores were more in agreement with managing natural resources for protection purposes (PURENV, low EID average = 4.28, high EID average = 4.77; t = -7.43, $p < 0.01$) and low-impact recreation (PURRECLOSUM, low EID average = 4.23, high EID average = 4.55; t = -4.90, $p < 0.01$). No difference was found on support for high-impact recreation purposes. Support for more areas for environmental purposes was also higher among those with higher EID scores (AMTENVSUM, low EID average = 3.86, high EID average = 4.64; t = -3.93, $p < 0.01$).

Discussion

We contacted two separate populations of recreationists in the studies reported on, using a modified EID scale and sets of items that addressed natural resource management purposes as well as amount of natural areas available for various purposes.

Respondents were most supportive of managing natural areas for environmental purposes. Support was also indicated for low-impact recreation purposes, and much less support from respondents for high-impact recreation purposes. Although Whites and people of color in both studies agreed that environmental protection should be a primary purpose for natural resource areas, people of color were more supportive of low- and high-impact recreation purposes. Further examination of these trends would be helpful in understanding if there is, in fact, shared agreement across ethnic/racial categories that environmental protection should be a central priority for natural resource management. Our findings suggest this may be the case. Additional support for this contention comes from our assessment of the amount of area needed for various purposes, which demonstrated support for additional areas for environmental purposes. Some support for additional areas for low-impact recreation was also found among both sets of respondents. It should be noted, however, that we did not ask respondents to make a choice among the purposes, rather they considered each independently. If tradeoffs are an issue, the selection of purposes might be different. In addition, the study 1 sample was relatively small, and both sets of respondents were from one region within southern California. Other geographic areas using respondents visiting natural resources other than national forest lands might yield different results. Additionally, larger samples from groups of color would facilitate breaking out findings by ethnic/racial groups to further our understanding of how non-Whites differ. Even then, members from various subcultures within a particular racial group (e.g., Asians) would be important to consider.

Our investigation into EID revealed its relationship to recreationists' ratings of purposes for natural resource management as well as amount of area that should be allocated for various purposes. Differentiation in the ratings of management preferences by level of EID is promising, demonstrating an application to furthering our understanding of public preferences for resource management. Of particular interest is the potential stability of EID and its utility as an alternate or complementary measure to be paired with meaning of place. Place attachment and place meanings have been shown to be particularly influential in public response to management alternatives and collaborative endeavors (e.g., Gunderson and Watson 2007). However, place meanings are linked to specific areas. If EID were paired with place meanings, one might gain a global perspective on individual response as well as a more specific one.

Conclusions

The EID scale appears to be valuable in shedding additional light on public preferences for natural resource areas, as well as interest in additional resource opportunities. The modified version provided a reasonable approach to the measurement of one component of environmental values and attitudes, assessing personal connection to the land. It was useful among groups of color and seemed to hold similar properties, increasing its value in our diverse society. Given its brevity and apparent relationship to other environmental attitudes as demonstrated in our findings, this modified scale is of interest in future research on natural resource management.

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The support for management of natural resources for environmental protection purposes is of particular interest to natural resource managers. Findings suggest our respondents highly value these purposes. Although support for additional areas for environmental protection and low-impact recreation was evidenced, particularly among the day users, a lack of support for high-impact recreation areas was found. Managers might reference these findings in allocating some areas for more of a natural resource protection focus. It should be noted that we did not incorporate a large number of user groups that engage in high-impact recreation and that we did not ask respondents to make tradeoffs between the various use types. We also did not evaluate preferences of surrounding communities who might not go to these areas but may still have an opinion about their management.

The support and interest in areas for environmental purposes is reassuring and suggests these publics share the goals of the Forest Service in caring for the land and providing recreational opportunities in a sustainable manner.

Literature Cited

Ajzen, I. 1988. Attitudes, personality, and behavior. Chicago, IL: The Dorsey Press. 175 p.

Clayton, S. 2003. Environmental identity: a conceptual and an operational definition. In: Clayton, S.; Opotow, S., eds. Identity and the natural environment: the psychological significance of nature. Cambridge, MA: Massachusetts Institute of Technology: 45–65.

Dunlap, R. 1992. Trends in public opinion toward the environment. In: Dunlap, R.E.; Mertig, A.G., eds. American environmentalism: the U.S. environmental movement 1970–1990. Philadelphia: Taylor and Francis: 89–116.

Gardner, G.T.; Stern, P.C. 1996. Environmental problems and human behavior. Boston: Allyn and Bacon. 300 p.

Gunderson, K.; Watson, A. 2007. Understanding place meanings on the Bitterroot National Forest, Montana. Society and Natural Resources. 20(8): 705–721.

Nickerson, R.S. 2003. Psychology and environmental change. Mahwah, NJ: Lawrence Erlbaum Associates, Inc. 318 p.

Zimbardo, P.G.; Leippe, M.R. 1991. The psychology of attitude change and social influence. New York: McGraw-Hill, Inc. 370 p.