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Use Encounter Standards and Curves for Achieved Privacy in Wilderness

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Abstract *The purpose of this study was to investigate the relationship between wilderness use encounters and degree of privacy achieved at three locations within a wilderness. The theoretical perspective of the research was grounded in environmental psychology, which emphasized the dynamic nature of person and situation fit, rather than the sociology of normative behavior. The study depicted privacy as a dependent measure and argued that privacy is not the opposite of perceived crowding. It also suggested that privacy may be a more appropriate dependent variable for encounter studies than those measures used in past recreation research. Privacy was operationalized as "the level of desired privacy achieved," measured on a 10-point scale. It was then compared with level of actual, ideal, and maximum use encounters for 600 users of a South Carolina wilderness area. Results indicated that number of actual group encounters was inversely related to degree of desired privacy achieved, in the hypothesized inverse curve pattern anticipated but never proved for satisfaction research. Encounter–privacy curves for ideal and maximum encounter levels also resulted in predicted patterns. Finally, degree of privacy achieved was negatively affected when ideal and maximum encounters were exceeded by actual encounters, showing a high degree of congruency between theorized and empirical findings.*

Keywords Privacy, use encounters, use standards, norms, wilderness recreation

Recreational carrying capacity and satisfaction are two issues that have been studied more than any others in outdoor recreation research. Beginning with the early thoughtful analysis by Wagar (1964) and the applied empirical work of Forest Service researchers (Hendee et al., 1978; Lime, 1970; Lucas, 1964; Stankey, 1973), much effort has been devoted to understanding the influence of use levels and encounters on people's enjoyment of wildland environments. University researchers have also contributed to the effort, perhaps best summarized in the classic article by Heberlein (1977) and the special issue on carrying capacity in a 1984 issue of *Leisure Sciences*. Finally, the dominance of recreational carrying capacity and satisfaction in outdoor recreation research is perhaps

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best demonstrated by its culmination in an entire book devoted to the topic (Shelby & Heberlein, 1986).

This relatively long and rich history of carrying-capacity research has evolved in many directions, concentrating on various dependent measures. For example, use levels and encounters have been thought to influence satisfaction, density, crowding, and solitude. In recent years, perceived crowding and normative explanations have been dominant. As summarized by Heberlein (1977), recreation researchers have used normative kinds of approaches in at least three ways. First, various researchers have developed measures of wilderness purism, aimed at identifying particular subgroups of wilderness users who share more sensitive beliefs about wilderness resources and experiences. Secondly, normative perspectives have been used to explain the phenomenon of asymmetrical antipathy that exists between different types (i.e., motorized vs. nonmotorized) of outdoor recreation. A third way that norms have been used is in the development of contact preference curves and encounter preference standards. A contact preference standard is "a normative construct based on shared beliefs about the appropriate number and type of encounters for a particular setting. The standard establishes an acceptable level for the number of encounters, and capacity can be specified if use level or some other management parameter affects encounters" (Shelby & Heberlein, 1986, p. 74).

The purpose of this study is to present yet another perspective for understanding the use level–enjoyment phenomenon of wilderness recreation. The perspective is grounded in environmental psychology, rather than the sociology of normative behavior. This study characterizes privacy as a dependent measure, and argues that privacy is not the opposite of perceived crowding. It includes a discussion of privacy and crowding as theoretical constructs, emphasizing that privacy and freedom of control may be more related to encounter levels in wilderness camping than perceived crowding. Next, the "being-away" attributes of privacy in wilderness environments are developed, an aspect that is essentially ignored in the normative approach to perceived crowding. Finally, research is presented where a measure of privacy is operationalized and empirically tested among wilderness users to establish encounter standard curves for wilderness privacy.

Past Research Approaches to Use Standards

As mentioned earlier, various approaches have been taken by recreation researchers in trying to understand the relationship between different dependent measures of wildland recreation enjoyment and use levels or encounters. Accordingly, different types of use standard curves and values have been derived, based on the dependent measure of recreation enjoyment studied and the approach used to operationalize the independent measures of use level and encounters. Following is a brief summary of this research, organized according to the dependent variable used.

Satisfaction Curves

Early research plotted the relationship between satisfaction level and number of users. Satisfaction curves were derived from economic models, grounded in the evaluative criteria of maximum marginal return (maximum aggregate benefit) and willingness to pay (Alldredge, 1973; Fisher & Krutilla, 1972). Satisfaction curves from at least two studies (Cicchetti & Smith, 1973; Stankey, 1973) showed that wilderness users will have lower levels of satisfaction or reduced willingness to pay when asked their reaction to *hypo-*

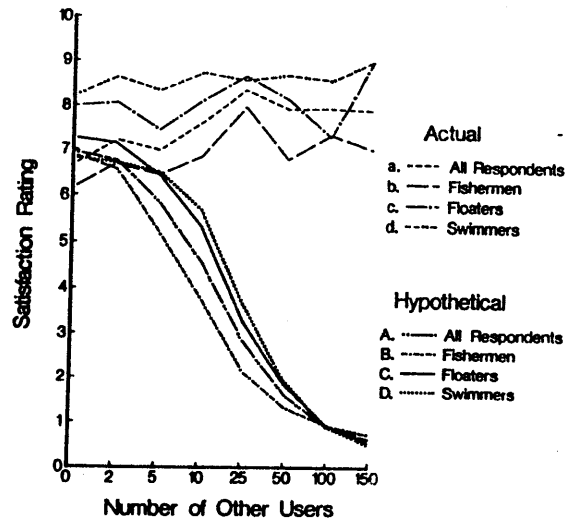

Figure 1. Relationship between use encounters and satisfaction under hypothetical and actual conditions (Source: Manning & Ciali, 1980, p. 337).

thetical encounters in wilderness areas. Thus, hypothetical satisfaction curves have demonstrated the inverse curve predicted by economic theory.

However, *actual* satisfaction curves have not demonstrated an inverse relationship between satisfaction level and actual encounter levels or use density (Manning & Ciali, 1980; Shelby, 1976; Shelby & Nielsen, 1975). There is little if any evidence that satisfaction curves and encounter standards exist in recreational settings when recording actual use levels and densities (Figure 1). Explanations for this phenomenon go beyond the scope of this paper and can be found elsewhere (Shelby & Heberlein, 1986).

Encounter Preference Curves

Based on the return potential model (Jackson, 1965) and normative models for perceived crowding, researchers next developed encounter preference curves and standards concerning user reaction to various suggested categories of use. For example, canoers were asked their reaction to seeing 1, 2, 3, 5, 7, 9, 15, 20, and 25 other canoers, inner-tubers, or anglers. There were five response categories ranging from very pleasant to very unpleasant (Shelby & Heberlein, 1986). From these data, encounter preference curves were developed to describe canoer norms for contacts with other canoers, inner-tubers, and anglers. However, these encounter preference curves are based on researcher-suggested use levels and user preference responses, rather than actual response to actual field encounters.

Tolerance/Acceptability Curves

Most recent research has evaluated visitor tolerance for optimum contact levels, essentially a measure of maximum preferred contacts. Visitors are asked to give their highest tolerable contact level (Shelby & Heberlein, 1986). Tolerance standards have been derived for various use parameters and in various levels of wilderness settings. In addition to asking recreation users for the maximum level of encounters/contacts they will tolerate, users have been asked for the use level that would be most acceptable (the ideal). Based

on descriptive measures of central tendency (i.e., mode, median) and dispersion (standard deviation) of visitor tolerance responses, normative standards and curves of use have been developed for recreation resource management.

Although tolerance/acceptability curves and standards are useful for investigating recreation user reaction to use levels, and offer a means of formulating management standards of tolerable and acceptable use levels, these standards still involve a preference rather than actual reaction to use levels. Some researchers have criticized the procedure because it forces respondents to formulate tolerance standards when, in fact, they may not care about use encounters and thus, have not formulated valid tolerance and acceptable limits of use (Roggenbuck & Williams, 1994). In addition, we have little evidence of how these individuals react to actual encounters when on site.

Privacy Encounter Curves

Although the Wilderness Act of 1964 speaks of solitude in its paragraph-length definition of wilderness, rather than satisfaction or perceived crowding, solitude use curves and standards could not be found in past recreation research. Privacy, of which solitude is only one dimension (Hammitt, 1982), also is limited in the recreation literature as a dependent variable in use estimate standards. In addition, privacy encounter standards, specifically based on field encounters experienced, rather than preferred encounter limits, were not found in the literature.

Environmental Psychology Basis for Privacy Approach

The first question to ask is, "Why is a privacy approach necessary, and is privacy any different as a construct than density, crowding, and solitude?" It is felt that the constructs of density, crowding, solitude, and privacy have been used too frequently as interchangeable concepts in describing recreation use level situations and people's reactions to these situations. Their past interchangeable and interrelated use, however, is not evidence of a theoretical viability evolved in the context of sustained systematic research, but rather of the preliminary attempts by recreation researchers to define and establish use standards and structures for managing wildland recreation experiences. Without systematic research with respect to these phenomena, we are not afforded empirical definitions in the form of the conceptual restraints that emerge from specified operational procedures (Proshansky et al., 1976).

While developmental and operational definitions of density, crowding, solitude, and privacy are beyond the parameters of this paper, it does seem worthwhile to offer brief distinctions among the interrelated concepts. Density refers to the number and distribution of individuals in a particular environmental setting. Crowding involves the negative evaluation of a density that exceeds a certain limit (Altman, 1975). Solitude is a dimension of privacy and refers to being alone, free from the observation of others (Proshansky et al., 1976; Stankey, 1989; Westin, 1967). Privacy is the claim of individuals, groups, or institutions to determine for themselves when, how, and to what extent information about them is communicated to others (Westin, 1967).

Components of Privacy

Privacy is not a simple, unidimensional concept with an easily identifiable class of empirical referents. Westin's discussion of privacy reveals the full complexity of the uses

of this concept. He identifies four dimensions or states of privacy and four functions of privacy. The four dimensions of Westin's privacy include:

(1) *Solitude*—the state of complete isolation from the observation of others.
(2) *Intimacy*—the state of seeking to achieve a maximal personal relationship between or among the members of a small group of selected members.
(3) *Anonymity*—the state of seeking and achieving freedom from identification and surveillance in a public setting.
(4) *Reserve*—the state of not revealing certain aspects of oneself that are either too personal, shameful, or profane.

These four dimensions of privacy function in turn to increase *personal autonomy, emotional release, self-evaluation,* and *limited and protected communication.* Operationalization and empirical testing of Westin's four dimensions and functions of privacy in wilderness recreation settings have been reported previously (Hammitt, 1982; Hammitt & Brown, 1984; Hammitt & Madden, 1989; Rutlin & Hammitt, 1994).

The wilderness privacy research led to several insights and conclusions. Wilderness privacy, with its many dimensions and functions, is a more complete concept than wilderness solitude for understanding the noncrowded and being-away aspects of wilderness experiences. Privacy, in its many dimensions, and freedom of choice are what the wilderness user may really be seeking when referring to solitude. By solitude, wilderness users may mean privacy in terms of withdrawing from social environments in which they have little control over whom and to what extent they must interact and communicate. They do not seek complete withdrawal from interacting with others (complete isolation), but rather freedom of choice in selecting with whom, when, and to what extent they must interact. The privacy they seek is withdrawal from complex social environments, not complete withdrawal from people. The overall function of privacy thus is to increase the range of options open to individuals so that they can behave in ways appropriate to their particular purposes. In this context, the psychological need for privacy is seen as the need to maximize freedom of choice, to remove constraints and limitations of behavior, of which those social constraints subsumed under the heading "lack of privacy" represent an important segment (Proshansky et al., 1976).

This conceptualization of the psychological function of privacy takes into account the paradoxical fact that privacy is essentially a social phenomenon and that it includes the freedom to interact with others differently in different situations and environmental settings. Westin's states of privacy specify certain socially prescribed conditions under which various types of behaviors become acceptable. Although the conditions, environments, and behaviors vary widely, they all have in common the property of maximizing the choices open to the individual. One way to achieve a desired freedom of choice is through the ability to control what goes on in defined areas of space that are significant for the behavior of the individual (Altman, 1975). For example, in wilderness areas the desired areas of space may be trailhead, trail, and campsite, and encounters the element to be controlled.

Altman, perhaps more than any other environmental psychologist, addresses the spatial aspect of privacy, particularly as it relates to the human tendency to both pursue and avoid encounters and interrelationships in environments. According to Altman (1975), privacy is an "interpersonal boundary-control process" that regulates social interaction with others to provide a person with a desired level of privacy. Thus, privacy is "an optimizing process" that aims at an optimal amount of contacts with others; too much or too little interaction is unsatisfactory. To achieve the optimum, a person has to restrict

(isolate) and, in some cases, seek contacts with others (intimacy). Privacy is, therefore, "a dialect process," a continuous interplay of opposing forces, to shut oneself off from others at one time and to open oneself up to interpersonal contacts at another time. The desired level of privacy is not stable, but rather dynamic, changing with environmental circumstances and time. It is as much an individual as a socially determined thing, defined personally and not by others.

Being-Away and Restorative Attributes

Privacy implies a certain sense of being away from others, other environments, or the effects of others. Adapting Altman's (1975, 1977) ecological analysis of privacy, wilderness privacy can be defined as "a geographic, social, and mental boundary control process that regulates, paces, and controls accessibility at various information processing levels to give coherence and restoration to people's being." Although being away is an important component of wilderness privacy, it too, like privacy, is a complex concept. For example, it would be naive to equate the being-away attributes of privacy with related recreation concepts such as solitude (being alone) or escape.

Kaplan and Kaplan (1989) present a convincing discussion of the differences between the concepts of escape and being away (p. 183). They argue that escape from a stressful environment, be it crowds, noise, or other forms of stimulus overload, is in and of itself not enough to experience a restorative environment and restorative state. Although getting away from daily distractions, from the everyday routine, and from concentrating on certain purposes are positive components, they are not sufficient to foster the restorative process so common to wilderness-privacy experiences.

What one is being away *to* is perhaps more important than what one is being away *from* when considering the restorative aspects of wilderness privacy (Kaplan & Kaplan, 1989, p. 177). From an environmental psychology and cognition perspective, being away is not enough for a restoration experience to occur. Rather, we must be away to other environments and "psychological worlds" where the properties of connectedness and scope are dominant, a concept called *extent* (Kaplan & Kaplan, 1989). In wilderness privacy, perhaps the opportunity exists to trade the seemingly disconnected and restrictive worlds of work and home for the natural, harmonious, and broader worlds of extent common to wilderness. This is not to say the work and home environments are always stressful, but rather that they are often shallow on the properties of extent when compared to wilderness. This explains why many wilderness users value the privacy of wilderness, even though they may experience little stress in the work and home environment.

Fascination and compatibility are two other components, in addition to being away and extent, needed for the restorative process to occur. The Kaplans (Kaplan & Kaplan, 1989: 184) define a fascinating stimulus as one that calls forth involuntary attention for processing. Fascinating environments and stimuli attract people's attention, thus keeping them from getting bored and requiring them to use directed attention to deal with the environmental information at hand. Compatibility deals with the element of congruency between what people want to do and what the environment demands they do. A compatible environment exists when a high degree of congruency exists among environmental patterns, the individual's inclinations, and the actions required by the environment (Kaplan, 1983). The restorative attributes of fascination and compatibility are perhaps best summarized by Kaplan and Kaplan (1989):

> An individual's decision and actions are determined jointly by the individual's purposes or inclinations and by environmental limitations or demands. Com-

> parably, the cognitive activity that guides action is stimulated by patterns in the environment as well as from within the person. If these functional domains are mutually supportive—if one's purpose fit the demands imposed by the environment, and the environmental patterns that fascinate also provide the information needed for action—compatibility is fostered. (p. 185)

The reader may be asking, what does this discussion of being-away and restorative attributes have to do with wilderness privacy and use encounter standards? It is felt by the authors that a measure of wilderness privacy is more than a measure of escape, based on number of other parties encountered. It is also more than a measure of boundary control, where mechanisms are being used to control others and their effects. Although all of these elements make up the complex construct of wilderness privacy, a measure of desired privacy achieved also involves the attributes of being away and the other associated attributes of a wilderness restorative experience. From an applied point of view, we can relate level of desired privacy achieved to various encounter levels at various wilderness locations to arrive at applied used encounter standards. However, from a more basic environmental psychology perspective, we must be mindful that the use encounter standards derived for wilderness privacy are only a surrogate measure of a much deeper phenomenon than escape from seeing others. The psychological attributes of being away to a restorative environment are perhaps the real underlying determinants of achieving a level of desired wilderness privacy.

Why Privacy Is Not the Opposite of Crowding

Much of the social carrying capacity, use limit, and normative standards research has used crowding or perceived crowding as the dependent variable. If privacy is to be used instead of crowding, how do the two concepts differ?

Altman (1975) and Proshansky et al. (1976) make several arguments for the interrelatedness, and yet distinctness, of the two constructs. Crowding involves the negative evaluation of a density that exceeds a certain limit (Altman, 1975). It is the *outcome* when acceptable limits of desirable densities in various situations have been exceeded and appraised as a negative state. In contrast, privacy is more of a *process,* an "interpersonal boundard-process" that regulates social interaction with others to provide a person with a desired level of privacy. It is an "optimizing process" that aims at an optimal amount of contacts with others; too much or too little interaction is unsatisfactory. It is a "dialect process," a continuous interplay of opposing forces, to shut oneself off from others at one time and to open oneself up to interpersonal contacts at another time (Altman, 1975).

Privacy is seen as a means to control situational environments from becoming crowded. Altman (1975) has proposed that a person situationally defines the desired level of privacy. This definition results from the combined influences of personal factors, interpersonal forces, and situational conditions. Predicated upon an individual's desired degree of privacy, one then attempts to achieve this objective through various privacy-controlling mechanisms. Following these efforts, one evaluates their effectiveness and decides whether the achieved privacy equals the desired condition. If what is achieved is less than desired, crowding occurs. Thus, privacy is seen as a process, consisting of interpersonal boundary-control mechanisms, to keep the undesirable outcome of crowding from occurring in given situations. Altman uses the boundary-control mechanism of nonverbal behavior (body language) in crowded elevators to illustrate the utility of privacy

maintaining processes by stating, "in a crowded elevator where we are forced to be close to strangers, we typically keep our hands at our sides, hold our bodies rigid and immobile, breathe quietly, and look up at the floor designation numbers, look down at the floor, or stare blankly ahead" (p. 35).

Other attempts to protect one's personal space and level of acceptable interpersonal interactions can be seen everywhere (Iso-Ahola, 1980). Houses are often built so that each family member can have a room or at least a corner of personal space; houses are frequently surrounded by walls, hedges, or fences. Working space is often so arranged that a person can have a private office or corner in which to carry out tasks and duties. Ways of regulating personal space differ for different environmental situations, but all aim to protect levels of achieved privacy within acceptable limits. Although means of regulating personal space are important to achieving levels of desired privacy, they may or may not have much to do with the exceeding of dense or high levels of encounter contacts with others, or more traditional definitions of crowding. For example, one may seek the private room in one's home for "quality" thinking time, even when no one else is at home; or at the other extreme, seek the busy city street to achieve Westin's (1967) two privacy states of anonymity and reserve.

Privacy and crowding in wilderness, in some respects, are similar to the being-away and escape concepts in how we approach wilderness enjoyment–encounter research. Privacy and being away in wilderness carry a positive connotation, while crowding and escape (from the undesirable) have negative overtones. Privacy, as associated with wilderness, is an interpersonal and information boundary-control state to be maintained within acceptable limits, so that the negative state of crowding does not occur. Thus, privacy is not the bipolar opposite on a privacy–crowding continuum, but rather can be seen as the acceptable and desirable *zone* on the continuum. In addition, privacy in wilderness would occupy the majority of the continuum, with crowding occupying an upper extreme where the desired level of privacy is no longer achieved. Conceptually, it could be seen as a "limits of acceptable change" continuum (Frissell & Stankey, 1972), where privacy dominates the larger acceptable range of desired encounters, and crowding the unacceptable range. Thus, crowding is not the opposite of privacy, but a situational state where the interpersonal boundary-control mechanisms have failed to keep interactions within the acceptable and desired range.

"Wilderness represents an environmental setting in which privacy—the ability to withdraw voluntarily from unwanted contact with others—is traditionally associated" (Stankey, 1989, p. 284). However, crowding rather than privacy, has dominated manager and researcher efforts to understand the influence of visitor encounters on some measure of recreation enjoyment in wilderness. If one accepts the argument that privacy is not the opposite of crowding—that it is a richer concept than crowding, and dominates the majority of the interactional continuum of desired state in wilderness—then privacy as a dependent variable for investigating encounter–enjoyment relationships in wilderness needs to be researched.

Privacy as the Dependent Variable

Because privacy had not been used previously as the dependent variable in use encounter standards research, and because there seemed to be a good environmental psychology basis for privacy–use encounter relationships, a study was designed to investigate privacy encounter standards and curves for wilderness backpacking. The premise underlying the study approach is that the achieved level of desired privacy received at various locations

in wilderness is related to the number of user parties encountered at the locations. Thus, the research approach differs from most previous crowding–encounter standards research in two primary ways: (a) achieved level of desired privacy replaces perceived crowding as the dependent variable; and (b) reported actual encounters, in addition to ideal and maximum encounter estimates, serve as the major independent variable.

Methods

Study Area

The research was conducted in the Ellicott Rock Wilderness during the fall of 1992 and the spring, summer, and fall of 1993. Ellicott Rock Wilderness is located in the Sumter National Forest in northwestern South Carolina, the Nantahala National Forest in western North Carolina, and the Chattahoochee National Forest in northern Georgia. The Wilderness covers 9,015 acres, with the majority in South Carolina. Use is estimated at about 10,000 annual recreation visitor days, with about 75% of it occurring between May and November. Types and amounts of use are estimated as follows: day hiking, 40%; fishing, 30%; backpacking and overnight camping, 27%; and hunting, 3% (U.S. Forest Service, 1992).

Sample

A total of 607 respondent data sets were obtained during the yearlong study, through use of an initial on-site contact survey and a follow-up mail questionnaire. Visitors were contacted inside the wilderness area at one of four trailheads. The time spent at each trailhead was proportional to the use estimates provided by the U.S. Forest Service for the trailheads. Four-hour block sampling periods per day, and sampling days, were randomly assigned to the four trailheads. Although the sampling schedule involved a stratified, proportional, random sample, sampling of respondents inside the Wilderness involved a convenience sample, with everyone over the age of 16 being contacted. Thus, both day and overnight users were sampled during the 38 days of field sampling.

A modified Dillman (1978) procedure was used for the postage-paid, self-addressed, mailback questionnaire. Two reminder postcards and a second mailing of the questionnaire, each at two-week intervals, resulted in a usable return rate of 71%.

Instrument

The mail questionnaire consisted of 12 pages, including a map of the study area. Seven "sections" of questions were included, the topics being: current visit characteristics, past use history, low-impact behavior, campfire use and attitudes, wilderness use encounters, wilderness privacy, and visitor background characteristics. For the purposes of this particular article, the two sections dealing with wilderness use encounters and wilderness privacy are of importance.

Operationalizing Privacy Use Standard Measures

Wilderness use encounters were defined for respondents as "number of other groups (parties) you saw regardless of size, or type of activity." Respondents were asked to report the number of groups encountered at three specific locations: trailhead, along the trail, and

at campsite or other wilderness destination (e.g., for day use destinations). For each of the three wilderness locations, respondents were asked to respond to the following three questions:

(1) What was the actual number of groups you saw at each location?
(2) What is the maximum number of other groups you could tolerate at each location before your desired level of privacy is lost?
(3) What is the ideal number of groups you would like to see at each location?

Wilderness privacy, the dependent variable, was operationalized in terms of "degree of desired privacy achieved while in the Wilderness." Respondents were instructed to indicate on a 10-point continuum scale (1 = low degree of desired privacy to 10 = high degree of desired privacy) the "extent you achieved your desired level of privacy while in the Wilderness." The wilderness privacy scale item was not located adjacent to the wilderness use encounter measure in the questionnaire, but followed it by three pages so as to guard against preconditioning biases.

Development of Encounter Use Standards and Curves for Privacy

Mean values and other measures of central tendency were computed for encounter levels at the three locations—for actual, ideal, and maximum encounters. Privacy encounter curves were formed by plotting levels of desired privacy achieved against levels of use encounters. Various control variables in addition to wilderness location were employed in analyzing the privacy–encounter use level relationships.

Results

Privacy Encounter Standards

Table 1 shows the mean number of ideal, actual, and maximum group encounters for the three wilderness setting/locations investigated. From both a conceptual and managerial standpoint, it was anticipated that the actual number of reported encounters would be close to the ideal number and would not exceed the maximum number tolerable. While the results do not match the above pattern exactly, they do match the expected patterns of: (a) ideal encounter levels being lowest, followed by actual and maximum, and (b) encounter

Table 1
Ideal, actual, and maximum group encounter standards for privacy achieved at three setting locations in Ellicott Rock Wilderness, South Carolina

	Use encounter standards (means)		
Location	Ideal	Actual	Maximum
At trailhead*	3.76^{a}	5.71^{b}	8.68^{c}
On trail*	3.19^{a}	4.12^{ab}	6.58^{c}
At destination site*	1.03^{a}	2.24^{bc}	2.46^{c}
All three sites combined	2.67	4.12	5.94

^{abc}Mean pairs with different superscripts were significantly different (Duncan's Multiple Range Test), $p < .05$.

*Mean encounter values for each location were significantly different (ANOVA), $p < .001$.

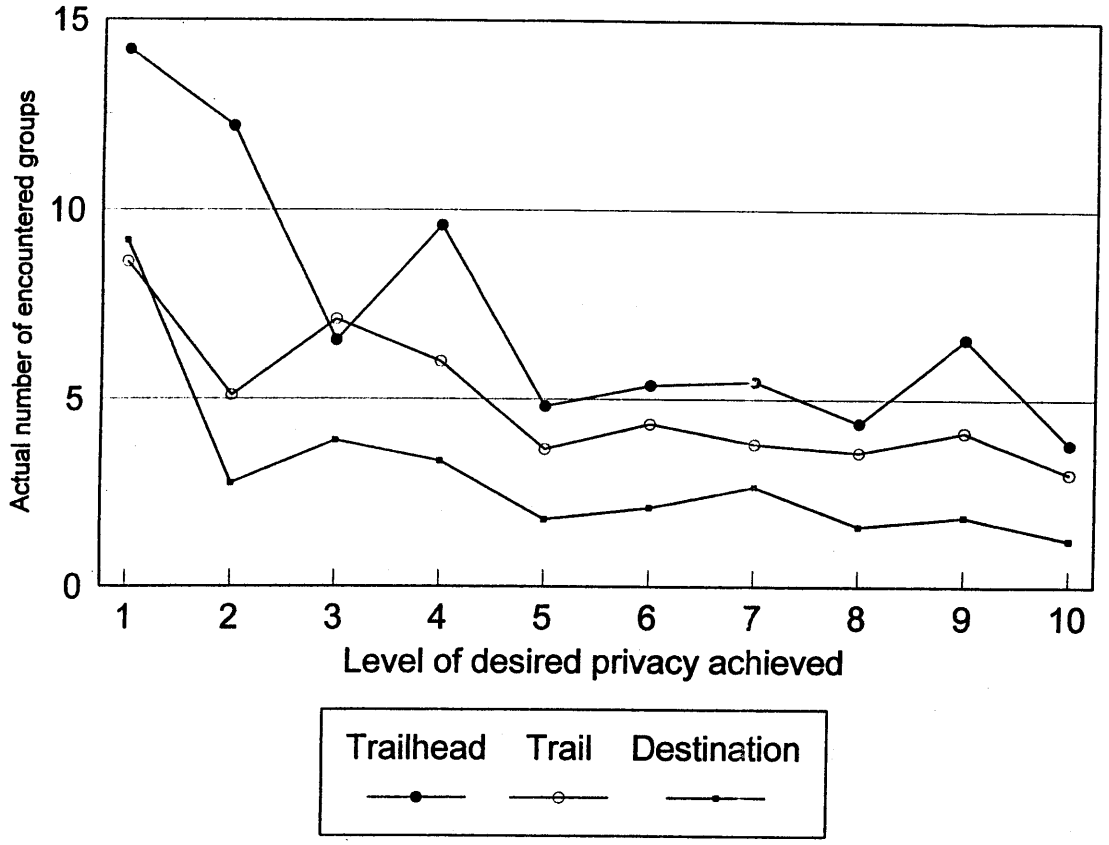

Figure 2. Level of desired privacy achieved for different levels of actual group encounters at three within-wilderness settings. Privacy measured on 10-point scale, where 1 = low and 10 = high.

standards that increase in magnitude from destination to trail to trailhead locations. Thus, the privacy encounter standards vary in a pattern predicted by the conceptual literature, where actual encounter standards should fall between ideal and maximum standards, and where encounters are likely to have their greatest influence on privacy at campsite/destination locations. Not only are the standards lowest for the destination location, they also have their smallest range of variance among the three standards for this location.

Actual Encounter–Privacy Achieved Standard Curves

When the level of desired privacy achieved was plotted against the number of actual groups encountered, inverse curves resulted (Figure 2). These curves, based on privacy achieved and actual reported encounters, resemble the hypothetical satisfaction curves of Stankey (1973), but which have not been producible with actual encounter values (Manning & Ciali, 1980; Shelby, 1976; Shelby & Nielsen, 1975).

Two observations are obvious from the curves in Figure 2. First, the level of desired privacy achieved increases as the number of actual groups encountered decreases, until the privacy level reaches about 5. After this point, encounter levels have little influence on privacy. Secondly, the pattern of influence of actual encounters on privacy achieved is similar for all three wilderness locations; only the magnitude of encounters varies. Thus, if one was to set managerial (wilderness management) use encounter standards for the three locations examined, using the actual encounter levels at a privacy level of 5, the standards would be: destination (2), trail (3–4), and trailhead (5) groups of users.

Preferred and Tolerable Encounter–Privacy Achieved Standard Curves

The plotting of level of desired privacy achieved against number of ideal and maximum encounters produces curves different from the actual encounter curves (Figure 3). Instead of an inverse curve, a gradually increasing sloping line is received. At first glance, the ideal and maximum plots would seem to imply that as encounters increase, so does privacy achieved.

However, the ideal and maximum encounters are "psychological" or "perceived" estimates, and need to be evaluated differently from actual encounters. Perceived crowding research has shown that the more sensitive certain respondents are to encounters (purist) and the more strict their preferred and tolerable limits, the more perceptive they are to crowding. The ideal and maximum plots in Figure 3 can be explained using the same phenomenon. Those respondents with the most strict (lowest) ideal and maximum encounter estimates said they achieved less desired privacy in Ellicott Rock Wilderness than those respondents with higher ideal encounter estimates. Of particular importance is the point at which maximum encounters exceed the number of encounters actually experienced. This value appears to be about 5 group encounters (all wilderness locations combined). For the three individual wilderness locations, the estimates are: destination = 2 groups; trail = 5 groups; trailhead = 9 groups.

Shelby and Heberlein (1986) have analyzed preferred and tolerable encounter stan-

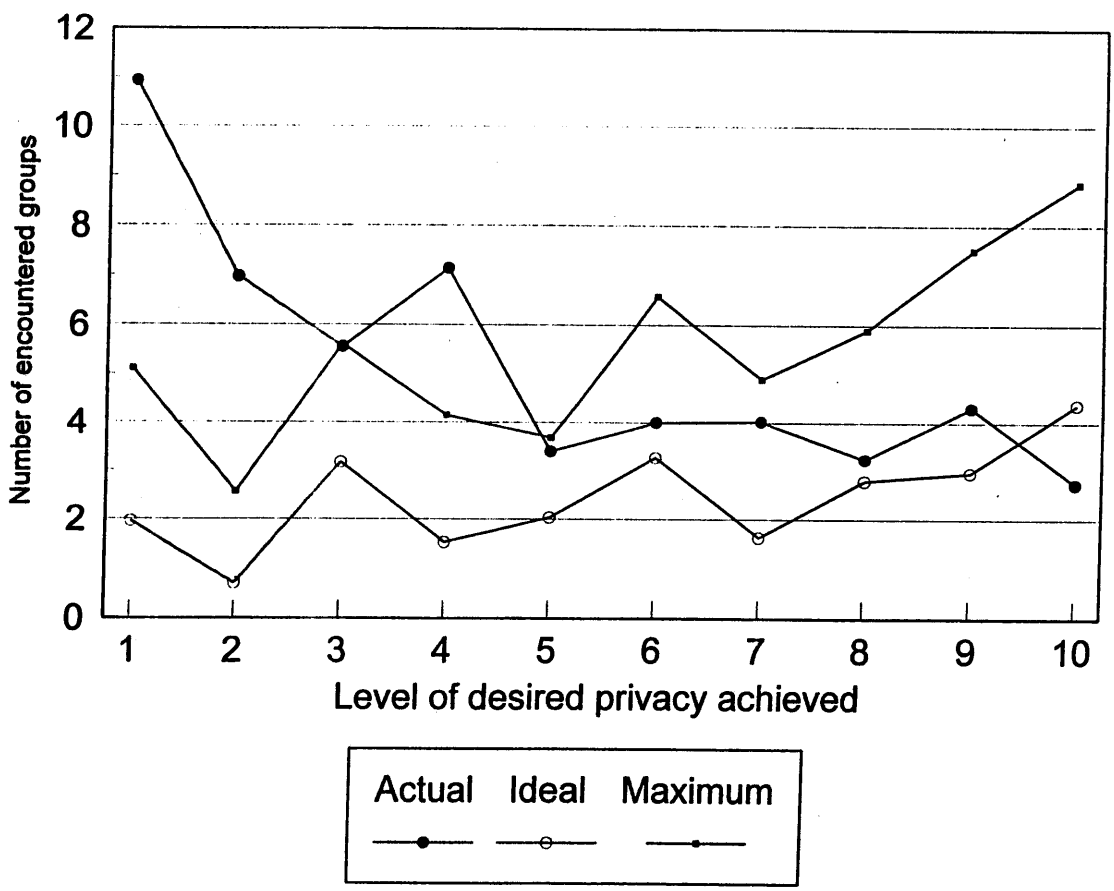

Figure 3. Actual, ideal, and maximum encounter curves, when plotting level of desired privacy achieved versus number of encounter groups. Privacy measured on a 10-point scale, 1 = low and 10 = high.

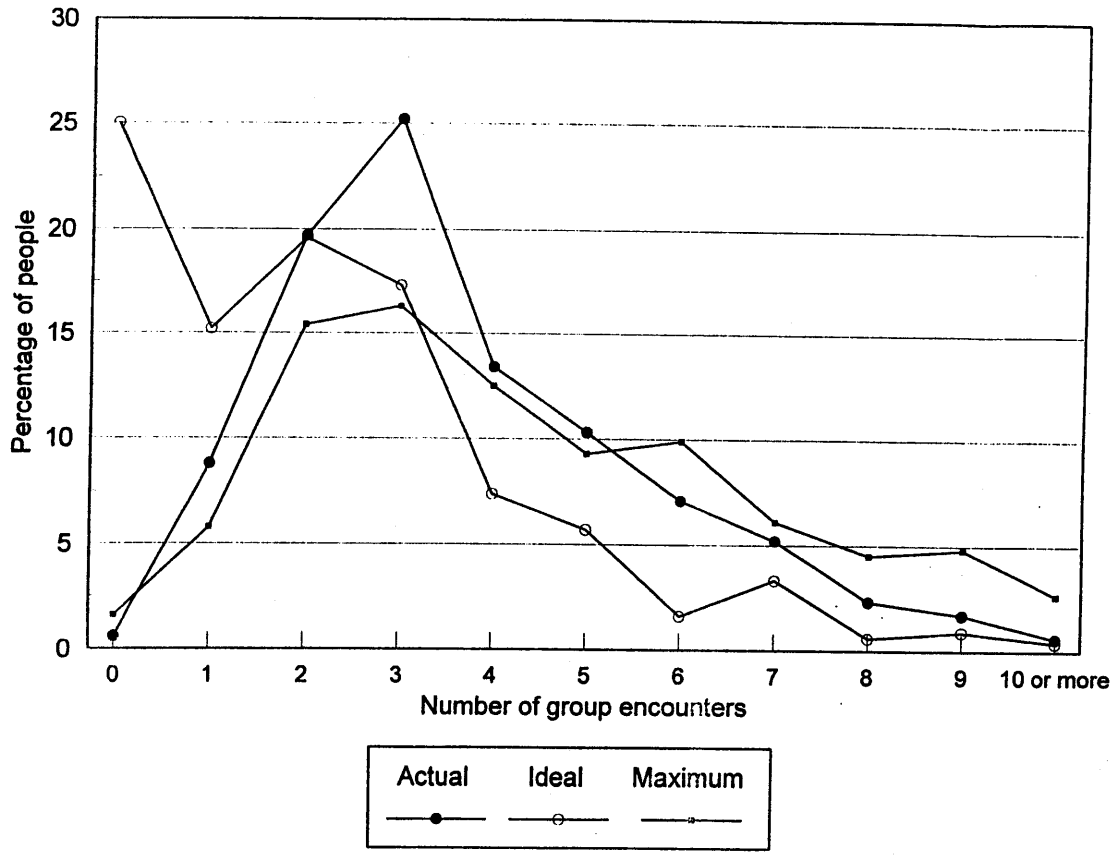

Figure 4. Actual, ideal, and maximum encounter curves, when plotting number of encounters versus percentage of respondents for each level of encounters.

dards in a different way, where percentage of respondents versus number of encounters have been compared. This normative approach looks for consensus or shared encounter use levels. When this approach is used with our data, curves are received similar in pattern to those of Shelby and Heberlein (Figures 4 and 5). In Figure 4, the highest percentages indicate that 25% of respondents prefer (ideal) zero encounters, that 16% will tolerate (maximum) three encounters, while 25% reported actually experiencing three encounters. Figure 5 presents results for the maximum number of tolerable encounters at each of the three wilderness locations. Percentages drop sharply after about 2 encounters at the destination, while trail and trailhead patterns are similar, peaking in the range of 3 to 5 encounters. However, the sharp peak at 5 encounters is most likely a result of digital preference bias, as similar but smaller in magnitude peaks were evident at 10, 15, and 20 encounters.

It is interesting to note that the pattern (not encounter levels) for maximum curves received for destination, trail, and trailhead locations are similar to those received for wilderness, semi-wilderness, and undeveloped recreation settings by Shelby and Heberlein (1986, p. 89). This finding is logical, since both classifications of encounter settings are likely to offer increasing opportunities for encounters and decreasing opportunities for privacy.

Privacy Achieved When Ideal and Maximum Encounters Are Exceeded

If use encounters are to affect the degree of privacy achieved, they are likely to have the greatest influence when ideal and maximum encounter levels are exceeded by actual

encounters experienced. To test this hypothesis, actual encounter levels were subtracted from ideal and maximum encounter levels for each of the three wilderness locations. This resulted in six measures of how well ideal and maximum preferences were met by actual encounters. Then, for each of the six new measure comparisons, each respondent was classified into one of three groups—less than, equal to, or greater than. For example, when comparing maximum versus actual destination encounters, the number of maximum encounters for an individual could be <, =, or > the actual number. After the classification, privacy means were calculated for each of the three groups within the six comparison measures (e.g., Table 2). Analysis of variance (ANOVA) and Scheffe's paired comparisons were used to test for mean significance differences.

Table 2 summarizes data for the encounter-exceeded measures and privacy achieved. Privacy achieved was significantly different for all six of the encounter measures. For those individuals whose actual encounters exceeded their maximum tolerances, the amount of privacy achieved was only 5.77 out of a possible high of 10. Visitors whose destination encounters equalled their maximum tolerances indicated a privacy level of 7.13 out of 10, while those whose maximum tolerances were not exceeded indicated the highest level of achieved privacy (7.67). The amount of privacy achieved when maximum encounter tolerances are exceeded is significantly different from privacy achieved when tolerances are not exceeded (Scheffe's paired comparison, $p = .05$).

When maximum encounters were exceeded on the trail, privacy level was only 5.16. If maximum encounters were equalled by actual encounters, privacy achieved averaged 7.03. For those individuals where actual trail encounters were less than the tolerable limit,

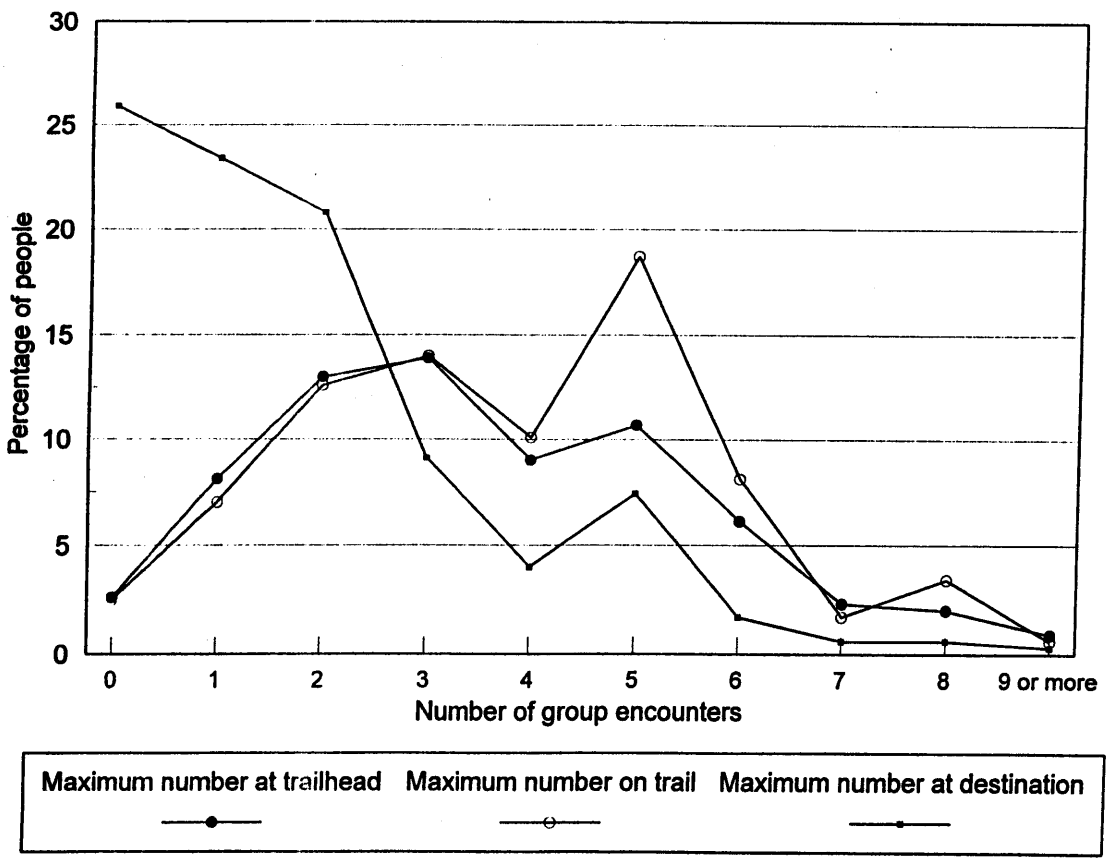

Figure 5. Maximum encounter curves for trailhead, trail, and destination settings, when plotting maximum encounters tolerated versus percentage of respondents for each level of encounters.

Table 2
Amount of privacy achieved when actual encounters are less than (<), equal to (=), or greater than (>) ideal and maximum levels of encounter

Encounter comparison	Privacy achieved[a]			Significance level
	<	=	>	
Maximum destination vs. actual destination encounter	7.67	7.13	5.77	0.001
Maximum trail vs. actual trail encounters	7.58	7.03	5.16	0.001
Ideal destination vs. actual destination encounters	7.57	7.53	6.38	0.001
Ideal trail vs. actual trail encounters	7.86	7.30	6.46	0.001
Maximum trailhead vs. actual trailhead encounters	7.41	6.60	5.75	0.001
Ideal trailhead vs. actual trailhead encounters	7.62	6.56	6.69	0.004

[a]Privacy achieved on a 10-point scale, where 1 = low degree of desired privacy achieved and 10 = high degree of desired privacy achieved. < means that actual encounters were less than ideal or maximum; = means actual encounters were equal to the other two; and > means that actual encounters exceeded them.

privacy was 7.58. There were significant differences between the mean privacy scores for those whose encounter tolerances were exceeded and those whose tolerances equalled or were greater than actual encounters.

The third comparison examined was ideal number of destination encounters versus actual encounters. Visitors whose actual destination encounters exceeded their ideal encounter levels averaged a privacy level of 6.38. Privacy-achieved levels for those whose actual encounters equalled ideals, and were less than their ideal level, were almost identical (7.53 and 7.57, respectively). Privacy achieved when the ideal number of destination encounters is exceeded is significantly different from privacy achieved when actual encounters are equal to or less than the ideal number of encounters ($p = .05$).

When ideal number of encounters was exceeded, visitors averaged 6.46 on the 10-point privacy scale. Privacy achieved when actual equalled ideal encounters was 7.30, and 7.86 when actual encounters were less than the ideal level. Again, significant differences existed among the groups compared.

Of all the encounter variable comparisons, the trailhead differences showed the least amount of variance in privacy achieved (see Table 2 for data concerning maximum and ideal encounter comparisons with actual encounters experienced).

Conclusions

The purpose of the analysis reported in this article was to investigate the influence of wilderness encounters on the degree of privacy achieved at three locations within a wilderness. The ultimate goal was not to establish specific use encounter standards for Ellicott Rock Wilderness, but rather to see if use encounters and achieved privacy were related to each other as environmental psychology theory would posit and if patterns of the relationship would produce use encounter curves as conceptually predicted by theory. The utility of achieved privacy as the dependent variable was of particular interest, inasmuch as satisfaction and crowding have shown little relationship to actual use encounters in past research.

From an empirical point of view, degree of desired privacy achieved served as a better

dependent variable for investigating the enjoyment–actual encounter phenomenon than has satisfaction or crowding of past studies. Actual use encounters were related to level of desired privacy achieved in the predicted inverse curve pattern at all three wilderness locations, and in the pattern of magnitude expected (e.g., destination more sensitive than trail and trailhead encounters, respectively). The degree of privacy achieved when actual encounters exceeded ideal and maximum encounters also showed a high degree of congruency with expected results, which has not been the pattern in past research (Patterson & Hammitt, 1990; Roggenbuck et al., 1991). Although only a first-generation study, our empirical findings are encouraging and merit future study involving replication and research where various subgroups (i.e., day vs. overnight) more motivated to seeking privacy would be investigated. This is not to infer that privacy is not a psychological need of day hikers, for theory would predict it is a need of all humans (Westin, 1967).

From a theoretical and conceptual perspective, achieved privacy would also be a better dependent variable than perceived crowding, at least for hiking/backpacking related activities. It could be argued that wilderness hiking/camping is a more remote, primitive, unconfined, and smaller group oriented form of restorative experience than river recreation, particularly commercial float trips. For example, the average backpacking party tends to average 2 or 3 individuals, while the average commercial whitewater raft party averages 6 to 12 individuals, plus several rafts per trip. Rivers also are corridors that may restrict some options for the spatial being-away attributes of privacy. Researchers in the past, including ourselves, may have been guilty of using perceived crowding as the dependent variable in formulating backpacking encounter standards when privacy would have been a more appropriate conceptual measure. In our opinion, based on an environmental psychology orientation, privacy is more conceptually linked to wilderness encounters when backpacking than is perceived crowding. Of course, these conclusions are speculative and only future research can address the issue.

A cautionary note is needed concerning the role that use encounters can be expected to play in level of desired privacy achieved. Although this paper argued for privacy as a dependent measure in use encounter studies, it is realized that privacy is a complex concept that involves more than number and type of use encounters. The degree of need, motivation, and desire for privacy among hikers and backpackers is likely to influence the specificity of encounter responses, and the influence of encounters on privacy achieved. If privacy is not desired by some respondents visiting wilderness, then their use encounter estimates may be little more than "forced guesses," as speculated by some recent researchers (Roggenbuck & Williams, 1994). Also, the being-away and related attributes of restorative experiences/environments have strong theoretical underpinning for the role of privacy in wilderness environments.

As to future research, the conceptions of privacy as outlined by Altman and Westin, and of restorative environments by the Kaplans, provide a powerful orientation for going beyond that offered by past recreation crowding research. For example, little is known about the personal space attributes of campsite privacy, or the territorial parameters of private space within wilderness settings. Future research should certainly be directed toward how recreationists use privacy boundary-control mechanisms in wilderness to maintain interpersonal encounters within acceptable limits. How are coping strategies and boundary-control mechanisms used to keep achieved privacy within the acceptable limits of desired privacy, so crowding does not occur? Much of the past crowding and carrying-capacity research has concentrated on the numerical "limit" at which desired privacy was exceeded and, thus, crowding occurred. However, the privacy portion of the privacy–crowding continuum is much larger in scope, and offers much territory for investigating

privacy–encounter relationships and mechanisms controlling these relationships within the range of acceptable limits.

Although the restorative benefits of being away from daily distractions, everyday routines and places, and certain purposes are related properties of wilderness privacy, little is known of these properties. Other aspects of restorative environments, in addition to being away, need to be investigated for their relationships to wilderness privacy. For example, the fascination and compatibility properties of wilderness and other restorative environments may be related to many of the functions that privacy serves—self-identity (Altman, 1975), reflective thought (Kaplan & Kaplan, 1989), and psychological well-being (Proshansky et al., 1976). Altman noted that if privacy-protecting mechanisms fail to control access to the self, more than crowding occurs. The absence or reduction of privacy, therefore, can pose a menace to self-identity and psychological well-being. Two previous studies of wilderness users have shown self-identity and reflective thought to be major functions of privacy in wilderness environments (Hammitt & Brown, 1984; Rutlin & Hammitt, 1994). The functions of privacy in wilderness, and the role that restorative environments and privacy-maintaining mechanisms play in enhancing these functions, constitute a rich avenue for future privacy research.

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