Wilderness Visitor Experiences: A Review of 50 Years of Research

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Abstract—This paper reviews 50 years of research on the experiences of wilderness visitors. Research on the nature of experiences began with an emphasis on motivations for taking wilderness trips and a focus on the experiential outcomes of wilderness visits. This perspective has been complemented by recent work that more deeply explores the lived experience in wilderness, its ebb and flow, and the process by which experience is constructed and developed into long-lasting relationships. In attempting to understand how wilderness settings might best be managed to protect high quality experiences, considerable work has been conducted on the effects of setting attributes on experience. In particular, the effect of use density on experience has been a prominent research theme. Among the insights of this body of research, is the realization that experiences are highly diverse and idiosyncratic and that visitors are highly adaptable and adept at negotiating the situations they experience. This suggests that it is impossible to know how to most effectively steward wilderness experiences without first deciding who and what to manage for. Moreover, given the idiosyncratic personal construction of experience, management action or inaction cannot guarantee high quality experiences for everyone.

Introduction

Wilderness preservation is a relatively recent idea, the first wilderness being designated in the United States in 1924 and wilderness legislation not passed until 1964. Part of the wilderness idea was to promote a new relationship between people and land, both in how wilderness lands were to be managed and in the experiences people might receive from wilderness visits. These experiences, the immediate thoughts, emotions and feelings associated with being in wilderness and the more enduring changes in attitudes, perceptions, and sense of self that arise from these encounters with wilderness, were considered likely to be unique and different from experiences in other recreational settings. Since they were poorly-understood,

research on wilderness visitors and experiences began shortly before passage of The Wilderness Act in 1964.

The first study of wilderness visitors was conducted in 1956 and 1958 (Stone and Taves 1956; Taves and Morgan 1960; Taves and others 1960; Bultena and Taves 1961) in the Quetico-Superior (now the Boundary Waters Canoe Area and Quetico Park in Canada). Visitors to the same area were more comprehensively studied by Lucas (1964a,b), starting in 1960. Also in 1960, visitor surveys were conducted, under the auspices of the Outdoor Recreation Resources Review Commission, in seven "wildernesses": Mount Marcy in the Adirondacks, Great Smoky Mountains, Boundary Waters Canoe Area, Yellowstone-Teton, Bob Marshall, Gila and High Sierra (Outdoor Recreation Resources Review Commission 1962). The other studies conducted in the early 1960s were a 1962 study of social characteristics of camping groups in the Three Sisters (Burch 1966; Burch and Wenger 1967), a 1964 study of visitors to the Bob Marshall, Mission Mountains and Glacier Park (Merriam and Ammons 1967) and a 1965 study of visitors to the Three Sisters, Eagle Cap and Glacier Peak wildernesses (Hendee and others 1968).

Reviewing these pioneering studies helps us understand the original motivations for studying wilderness visitors and provides initial glimpses of themes, perspectives and methods that are still playing out in visitor experience studies today. Some of the questions originally asked have been quite thoroughly addressed. For example, much is known about who visitors are, what they do on their trips, and their perceptions, attitudes and preferences (Roggenbuck and Lucas 1987; Dawson and Hendee 2009) although some of the specifics have and are likely to evolve over time (for example, age and gender). Other questions—particularly those related to the character of wilderness experiences—have been less adequately answered and/or less effectively translated into practice.

The pioneering wilderness researchers clearly believed there was something unique to a wilderness experience and they were concerned that this experience was rare and at risk—that management was necessary in order to maintain high quality wilderness experiences and that appropriate management required good research. Consequently, they and succeeding generations have built a rich body of research, most of it fundamentally aimed at addressing the following questions: (1) **what do visitors experience in wilderness?** (2) **what factors influence the nature or quality of the experiences visitors have in wilderness?** and (3) **how can managers protect**

and/or enhance visitor experiences? Embedded in the first two questions are three additional questions. How stable are the answers over time? How much variation is there among visitors? What factors might explain these temporal or social differences?

The intent of this paper is to review the approaches taken to answering the first two of these questions. Two major sections review research on the nature of wilderness experience and attributes that influence visitor experiences in wilderness. Then we discuss what this knowledge suggests in a concluding section on the stewardship of wilderness experiences. We must keep in mind that any contemporary assessment of these questions reflects current views and experiences of visitors. Looking back at the research we may be able to identify some patterns that have remained stable. Indeed most studies of trend suggest relative stability (Lucas 1985; Cole and others 1995); but there remains the possibility that visitors and their behavior may change in the future.

The Nature of Wilderness Experiences _____

Several papers in these proceedings address the nature of the wilderness experience from one perspective or another. The purpose of this section is to provide an overview of the various approaches to the topic. Underlying these different ways of approaching the nature of experience are two broad, contrasting perspectives on the nature of well-being or quality of experience. An important distinction in the psychological literature on subjective well-being is whether well-being is understood to be the outcome of satisfying needs and attaining goals (telic model) or the pleasure that comes from being involved in the pursuit of these goals, even when they are not met (autotelic model) (Omodei and Wearing 1990). Each of these two perspectives can contribute to our understanding of the situational (onsite) factors that influence the character and quality of a given experience. As described below, motives for wilderness generally follow a telic model focused on goal attainment. In contrast, wilderness as lived experience and wilderness as a long-term relationship tend to incorporate autotelic approaches to well-being.

Another important feature of the differing approaches involves how researchers address the temporal scope and dynamics of experience. Researchers have most often treated wilderness experiences as discrete events, conceived them as the psychological outcomes desired or attained from a wilderness visit (as if people knew exactly what was expected and desired from their visit), and studied them using quantitative techniques. Other researchers, often employing qualitative techniques, have attempted to understand experience as a long-term phenomenon (as relationship for example), have conceived of experience as emergent (as if people had little idea of what was expected or desired) and multiphasic, and have attempted to learn as much about the process of experience as the outcome. Although these latter approaches have become more prevalent recently, some elements of these perspectives were present in the very earliest studies of wilderness visitors. Clawson and Knetsch

(1966), for example, made the early suggestion that recreation experiences were not limited to that which occurred at the recreation site, but also involved anticipation, travel to, travel home, and recollection. Likewise, early studies of wilderness use sought to identify the long-term therapeutic or educational value of nature/wilderness experiences (Kaplan 1974). Below we characterize and contrast the various approaches organized into three types: motivation-based, experience-based, and relationship-based.

Motives for Wilderness Visits

The motivation approach carries various descriptors including goal-directed, expectancy, outcome, benefits, and satisfactions. Often associated with the approach is some implied or explicit comparison between expectations and outcomes (Brooks and others 2006). Motivations, goals, and expectations usually connote what people seek or expect from the experience, whereas outcomes, satisfactions, and benefits refer to what people receive from the experience. Presumably a quality experience is one in which the participant receives an experience at least as good as the experience sought or expected. Also associated with the motivation approach is the idea that people seek multiple satisfactions or specific "bundles" of outcomes. Thus overall benefit or well-being is often understood in a telic model as some form of multi-attribute utility.

The earliest insights into wilderness experience came from attempts to understand the basic motivations for why people visited wilderness. In the area that now is the Boundary Waters Canoe Area Wilderness, Bultena and Taves (1961) reported that the most prevalent motives involved adventure and exploration, struggling with the elements, experiencing a less artificial setting, away from the cares of the workaday world, while Lucas (1964b) found that people visited to find solitude, be with members of one's group, learn about the area and commune with nature. Over subsequent decades, motives have been studied more systematically, most notably in the work of Driver and associates (for example, Brown and Haas 1980; Manfredo and others 1983). This work suggests that there are common motives for visiting wilderness, such as solitude and experiencing nature, but not all motives are shared. People vary in the experiences they seek (Hall and others 2010) and none of the experiences sought appear to be exclusively dependent on a wilderness to be realized (Stankey and Schreyer 1987).

Driver and associates (1987) summarized data collected in 1977-1978 for responses to 16 wilderness motivations across five Colorado wilderness areas, three North Carolina wilderness areas and four other "undesignated" wilderness areas (two from Colorado, one from Wyoming and one from Vermont). Each motivation was rated as to how much it either "adds to" or "detracts from" the respondents level of satisfaction with their visit to the particular area. These data suggest relatively little difference across areas in the most important motives, which in overall rank order were: enjoy nature, physical fitness, reduce tensions, escape noise/crowds, outdoor learning, sharing similar values, independence, family kinship, introspection/spiritual, considerate people, achievement/stimulation, physi-

cal rest, teach/lead others, risk taking, risk reduction and meet new people. They also compared these results to satisfactions associated with three "nonwilderness" areas: a sand dune area in Utah, a reservoir in Illinois, and a floatable section of the Arkansas River in Colorado. Enjoying nature, physical fitness, and reducing tensions were among the top five for all three areas as was escaping noise/crowding for all but the sand dune area. These data suggest few differences between wilderness experiences and other outdoor recreation experiences.

In a more contemporary study, Cole and Hall (2008a) summarized motivation data collected across 13 wilderness areas in Oregon and Washington in 2003. They examined 14 motivations in terms of both what was sought and what was experienced. Among the most highly sought experiences were: closeness to nature, away from crowds, sense of being away from the modern world, sense of freedom, wilderness opportunities, sense of remoteness, solitude, sense of challenge, sense of surroundings not impacted by people (average ratings > 5.0 on a 7 point scale). Lowest rated motives were: be near others who could help if needed, be my own boss, think about who I am, develop personal spiritual values, and learn about this place. Generally speaking, when asked about experiences achieved, results were similar to the results for experiences sought. However, Cole and Hall also calculated differences between experiences achieved and experiences sought by subtracting ratings on the latter from ratings on the former. The experiences that were least achieved were those for being away from crowds, solitude, sense of remoteness and sense of surroundings not impacted by people, the experiences most strongly associated with wilderness.

In part to understand whether wilderness provides unique experiences, an important question behind the motivation approach is how participants acquire their motives? Do motives reflect differences in individual personality, the amount or character of past experience, or are they dependent on cultural background and/or socialization (upbringing)? As Brooks and Williams (in press) suggest, motives for wilderness experience are at least partly learned in the process of engaging in wilderness experiences. This learning involves both direct experience of wilderness (that is, past experience in wilderness) and social interactions with others who transmit values and preferences to participants. Other researchers have shown that to some extent motives are personality-dependent; they reflect differences in one's basic orientation to nature (Knopf 1983; Driver and Knopf 1977).

A related question is how much wilderness motives vary across wilderness areas and what factors might explain this variation. Driver and others (1987) report more similarity in average motivation ratings across several wilderness areas than between wilderness and other outdoor settings. Several studies have employed "segmentation" techniques from market research to identify groups of participants who exhibit different profiles or bundles of motivations (Brown and Haas 1980; Hall and others 2010; Legare and Haider 2008). Studies have also segmented visitors based on experiential factors (such as involvement or place attachment) and described these differences in terms of motivations or benefits (Hall and others

2010; Kyle and others 2004b; Schreyer and others 1984; Warzecha and Lime 2001). These and other studies have had some success explaining these different segments in terms of such variables as demographic and trip characteristics (Brown and Haas 1980; Hall and others 2010) and experiential factors such as use history, activity specialization and place attachment (Williams and others 1990; Graefe and others 2000).

The key finding here is that different segments of visitors focus on particular motives or experiences and thus place different levels of importance on wilderness conditions such as solitude, primitiveness, social interaction, and so on. This variation in motivations helps explain why the influence on experience of attributes such as use density, discussed in the next section, are not as substantial or consistent as might be expected. The key management implication here is that stewardship actions that protect experience qualities important to one segment might have adverse consequences for a different segment. Using these "benefit segmentation" techniques it becomes possible, at least theoretically, to identify some subset of wilderness visitors who seek experiences that closely align with the qualities specified in the Wilderness Act.

Taken together motivation studies provide some insights regarding the issue of the uniqueness of wilderness experiences versus other outdoor/natural settings. There is ample evidence that motivations for visiting wilderness vary from person to person and are to varying degrees similar to other nature based activities (particularly human powered ones). Still, results suggest that for at least some segments of wilderness visitors wilderness provides some "bundle" of experience attributes that are more typically found in wilderness settings (Roggenbuck and Driver 2000). In an open-ended question about what makes wilderness experiences different, visitors to wildernesses in Washington and Oregon most frequently mentioned a combination of experiential and setting attributes—solitude, scenery, no impact, quiet, and challenge (Cole and Hall 2009).

Wilderness Experience as Lived Experience

Within the past few decades there have been a number of studies of discrete wilderness visits that more deeply explore visitor experience as the thoughts, moods, emotions, and physical responses that arise from visitors' activities, their physical and social context and focus of attention, in other words "experiences as they are lived, felt or made sense of by the people being studied" (Stewart and Floyd 2004, p. 450). What Borrie and Birzell (2001) describe as the experience-based approach: (1) more directly asks the visitor to describe their experience instead of asking them to evaluate various experiential or motivational components of it, (2) does not explicitly ask respondents to link these descriptions to setting attributes or satisfactions, (3) attempts to capture immediate conscious experience by seeking these descriptions closer in time to the event, and (4) often examines the ebb and flow of experience as it unfolds across the course of the visit instead of summarizing the entire experience into a single evaluation. Research examining lived experience has employed two distinct methodological approaches, immediate conscious experience

monitoring and retrospective accounts of experience. One way to get at the lived experience has been to "sample" the immediate conscious experience of respondents by obtaining repeated measures of their thoughts, feelings, and focus of attention at various (often random) intervals throughout their visit to wilderness. In one study on trails adjacent to the Maroon Bells Wilderness Area (CO), hikers were asked to rate items measuring mood, satisfaction, and scenic quality at 12 predetermined points along a trail (Hull and others 1992; Hull and Stewart 1995). Researchers found that much of the variation in mood and satisfaction were correlated with perceptions of scenic quality.

Other studies examined visitors' "focus of attention" at multiple points during a wilderness visit noting differences in attention to the influences of other people, the activity being undertaken, and the environmental setting. McIntyre and Roggenbuck (1998) observed how particular environmental settings influenced experience, but they also noted some general temporal dynamics that reflected the way familiarization with the setting tended to overcome initial apprehension. Borrie and Roggenbuck (2001) noted greater focus on the environment and on introspection at the conclusion of the visit compared to the entry phase and less focus on group members during the immersion phase. They also noted higher scores on humility and primitiveness during the immersion phase.

Whereas the above studies have often employed quantitative assessments of experiential features, other studies have used daily journals and/or interviews to examine the ebb and flow of wilderness experiences. Mirroring the findings of McIntyre and Roggenbuck (1998), Kaplan and Talbot (1983) noted how adolescents' diaries showed increasing comfort and familiarity with the experience over time but also became more detailed and more intensely emotional. Some of these studies focus less on the ebb and flow of experience and more on gaining deeper insight into what is being experienced. In an example drawing on content analysis of personal journals and retrospective interviews obtained from two groups of women in different wilderness settings (Boundary Waters and the Grand Canyon), Frederickson and Anderson (1999) discussed how a sense of the expansiveness of the landscape and the power of nature provided spiritual inspiration for most of the women. They also found that positive interpersonal interactions combined with immersion in a wilderness setting contributed to the perception of elements of the landscape as possible sources of spiritual inspiration. Hall and Cole (in press) studied the immediate conscious experience of visitors to three popular wilderness destinations. Interviews revealed much about wilderness experience in terms of an enriched sense of awareness and appreciation of the natural environment, self discovery and personal growth, and how people connect with others in their group.

These experience-based studies reveal much about the rich, varied and fulfilling experiences that almost everyone has in wilderness. Although people's experience appears highly varied—involving different activities and types of places—the focus of attention is most commonly on the natural environment, as shared with other people in one's group. Focus on self

has been found to be less prevalent in studies of immediate conscious experience (Hall and others 2007); however, other studies, particularly those using self reports from organized wilderness outings, show that for some people there is a significant focus on self discovery. Studies have explored experience as a source of spiritual inspiration (Fredrickson and Anderson 1999), as transcendent (Williams and Harvey 2001), and in terms of emotional outcomes (Farber and Hall 2007).

Despite some commonalities, experiences are often idiosyncratic, "influenced by individuals' unique identities, their current personal projects, recent past experiences, and situational influences" (Patterson and others 1994, p. 244; Arnould & Price 1993; Patterson and others 1998). Experiences are emergent to a substantial degree, as well as dynamic, varying across the wilderness visit (McIntyre and Roggenbuck 1998; Borrie and Roggenbuck 2001). These findings suggest the limitations of characterizing experience quality in a single discrete rating or as the degree to which preconceived expectations for desired experiences are met. They also demonstrate the challenge of stewarding wilderness experiences, when experiences are highly idiosyncratic and personally constructed and given meaning. Providing or protecting certain setting attributes will not necessarily result in desirable experiences. The linkage between settings and experiences is probabilistic rather than deterministic. Patterson and others (1998) evoke the concept of "situated freedom" to make this point. Managers help structure the environment, thereby setting boundaries around what can be perceived or experienced. However, "within those boundaries recreationists are free to experience the world in highly individual, unique, and variable ways" (p. 426).

Wilderness Experience as Long-Term Relationship

A third perspective on experience focuses on the meaning or significance of the experience in terms of the role it plays in the larger context of one's life. This approach to experience emphasizes its emergent, transactional, and long-term character. Though a long term perspective is, to some degree, implicit in the conceptual work of Driver and associates regarding the benefits that accrue from experiences (Roggenbuck and Driver 2000), the focus of relationship-based studies is on the *process* of meaning making and identity affirmation rather than the attainment of specific benefits. It is emergent and transactional in the sense that the experience evolves across time and the individual is seen as an active participant in creating the experience. While sharing much in common with the notion of a lived experience, the relationship-based approach focuses on experience as an unfolding story or narrative that organizes meaning and identity for the individual (Borrie and Birzell 2000; Brooks and Williams in press).

Following from the view that wilderness experience is often "motivated by the not very well-defined goal of acquiring stories that ultimately enrich one's life" (Patterson and others 1998 p. 423), Patterson and associates (Patterson and others 1994, 1998) showed how experience is organized as an emergent narrative rather than an evaluation of outcomes relative to

expectations. In a series of interview based studies they found that experience is contextual, influenced by individuals' unique identities, their current personal project, recent past experiences, and situational influences. This contextual quality was particularly evident in the various ways visitors experienced and interpreted the challenges of negotiating a river in Juniper Prairie Wilderness (FL), which was the dominant feature of the setting. Building on the concept of "situated freedom," which recognizes that within the boundaries set by the environment participants are free to experience the setting in variable ways, the research showed how participants dealt with widely varying interpretations of the challenge they experienced in floating the river. Among those who initially interpreted challenge as mildly negatively, upon greater reflection, they often came to realize that overcoming challenges was precisely what made the experience an enjoyable story to relive. For others, challenge was so dominant and intense in defining their experience that they had little capacity to reflect on other aspects of the experience. In the end it was less a matter of whether they experienced more or less challenge than they expected, but how they made sense of those challenges.

Others have employed the relationship perspective on experience, building on the premise that some visitors may value their long-term relationships to places or to wilderness experiences generally more than the specific attributes or conditions of a particular place or wilderness visit in isolation (Brooks and others 2006; Dvorak and Borrie 2007). The relationship perspective in wilderness experience research is closely associated with the place literature (Williams 2008), particularly as it was used to describe resource specificity or dependence as a factor in conflict (Jacob and Schreyer 1980; Schreyer and others 1981). Initially much of the work focused on measuring the strength of attachments visitors held toward specific wilderness areas (Williams and others 1992b; Watson and others 1994; Kyle and others 2004a,b). Increasingly this work has focused on the social and psychological *processes* involved in developing and maintaining relationships with wilderness areas and what those processes may mean for managing the quality of visitor experience.

As discussed in Brooks and Williams (in press), applying a relationship metaphor to the study of wilderness experience focuses on the way ongoing experiences people have in a wilderness area allow them to negotiate and establish meanings not only for that place but also for themselves and their relationships with other people. Place meanings are thought to build up through continued participation with the place to the point that a relationship exists between person and place. The relationship can be used to affirm aspects of one's identity and substantially affect one's broader quality of life (Brooks and others 2006, 2007; Smaldone and others 2005).

A key idea here is that individuals play a large role in shaping the character and quality of the experience as a transaction between the person and the setting. The setting may set broad boundaries of possibilities, but situated within those boundaries individuals are free to create their own experience and meaning. They do this continuously—before, during, and after the experience—to form the elements of an identity narrative or story. Framed from within this relationship model, experience quality can be understood "as the extent to which a recreation engagement succeeds as an expression of one's self" (Williams 1989, p. 433). This assessment is not so much a summary judgment at any particular time. Instead it involves the ongoing process of identity affirmation in which our wilderness activities, both on site and off site, become symbolic expressions of our identities (Haggard and Williams 1992).

Solitude, Primitive, and Unconfined: Key Features of Wilderness Experiences?

Having briefly reviewed some of the different ways wilderness experience has been studied, one of the key unresolved issues is what if anything differentiates wilderness experiences from other outdoor recreation experiences. Given its centrality in the Wilderness Act, much attention has been devoted to the concept of solitude. Solitude is the one word, beyond the mandate to provide for primitive and unconfined types of recreation, used to describe the type of experience wilderness should provide. To psychologists, solitude means being alone, without intrusions, where others cannot observe you (Westin 1967). Since few wilderness visitors choose to be alone, Hammitt (1982) has argued that the broader psychological concept of privacy is more aligned with the intent of the Wilderness Act. If there is a high degree of privacy, wilderness visitors can freely choose how much and what type of interaction with others they want. In recent work, Cole and Hall (2008a) report results suggesting that solitude is valued but is often not viewed as critical to having a "real wilderness experience." Notably, solitude is not an "all-or-nothing" phenomenon; it can be intermittently experienced even in the most heavily-used places in wilderness (Hall and others 2007). Hammitt (in press) reviews our current understanding of wilderness privacy and solitude.

The other two experiential descriptors in The Wilderness Act, primitive and unconfined, have received far less attention in the literature. Primitiveness is often considered to be the ability to connect with raw nature absent the clutter of modern conveniences (Borrie 2004; Roggenbuck 2004). Thus, with recent advances in lightweight electronic equipment such as phones, GPS units and emergency beacons, questions about their impact in managing for primitiveness are growing (Martin and Pope in press; Shultis in press). Similarly, although an unconfined experience is one in which the visitor retains the internal locus of control over such decisions as where to go, what to do and how to behave (McCool 2004), it is also clear that wilderness management will sometimes, of necessity, restrict access and behavior.

Johnson and others (2005) explore how primitiveness, naturalness, remoteness and wilderness were defined by visitors to three wildernesses. Primitiveness was largely defined in terms of level of development and recreational impact on the environment. When experienced wilderness users were asked about primitiveness and unconfinement, primitiveness was defined in terms of a need to rely on one's personal skills and on the absence of obtrusive development and management. The most

prominent themes for unconfinement were freedom of access and lack of regulation (Seekamp and Cole 2009). While none of these attributes are unique to wilderness, in wilderness these attributes, in combination, take on unique importance.

Summary

One way to look at these differing approaches is to suggest that our understanding has shifted from telic to autotelic, from achieving desired and expected outcomes to emergent lived experiences and the formation of long-term relationships with settings and activities that lend meaning to life. While this may be the historic trend in research emphasis, moving from description to explanation, another way to look at this is to appreciate the ways in which our understanding of experience has grown from the seeds of relatively simple consumer satisfaction perspectives into a more mature set of branching models that support one another. Thus from the telic perspective, people generally have goals that motivate an experience, but they are rarely locked into those goals and in fact are often flexible and renegotiate their motives to suit the situation at hand (Cole and Hall 2008b). From an autotelic perspective, goals give the experience shape and purpose, but often the joy and pleasure comes as much from the creative, flexible, and ongoing pursuit of those goals as their eventual attainment (Omodei and Wearing 1990). Moreover, because the moment by moment quality of experience is short lived, as social and psychological beings we are compelled to organize our fleeting experiences into a coherent story or narrative that gives us meaning and helps us make sense of our lives as a whole.

Thus each model captures something essential about experience and each offers wilderness mangers potential insights as stewards of those experiences. Visitors care about the basic experiential ideals of wilderness (such as, solitude, primitive, and unconfined recreation) and these surely motivate participation even if they mean different things to different people. However, these ideas do not readily translate into precise standards because people creatively negotiate their experience as it unfolds. And beyond the immediacy of wilderness visits, visitors often form relationships with wilderness places and activities that become important aspects of their identities. This suggests that managers need to be good stewards (partners) in those relationships and not just focus on onsite experiences. Management actions, however well intended for protecting the wilderness resource and visitor experiences (such as use limits), need to consider the long term effects on these broader relationships. In addition, relationships are not only personal but are embedded in the larger cultural, technological, and environmental context that can affect the character and value of wilderness and the ways visitors interact with these places in the future (Dvorak and Borrie 2007).

In sum, studies of the nature of the experiences people have in wilderness illustrate how rich and diverse such experiences are, in terms of what people seek, perceive, and ultimately attain. In addition to being diverse and idiosyncratic, experience outcomes are to some degree adapted to suit the situation, and do not seem to be uniquely dependent on wilderness settings, making it difficult to conclude what is unique about a wilderness experience. For some visitors, wilderness may be just a particularly good place to have certain types of outdoor experience. For others however, wilderness is, in fact, seen as a unique setting in which to have the kinds of experience envisioned in the Wilderness Act. The next section provides an overview of what research shows about how various attributes of the wilderness setting shape those experiences.

Effects of Attributes on Visitor Experience _____

Most of the wilderness research on attributes that influence experience quality has been devoted to the effects of amount of use, as it was assumed that increasing use was the primary threat to quality wilderness experiences. Consequently, this section begins with a lengthy review of what has been learned about the effects of amount of use on the nature of the experience and experience quality. This provides an opportunity to illustrate the diverse approaches that have been employed regarding this issue. Research that has explored the influence of other attributes will also be reviewed, as will our understanding of variables that mediate the effects of attributes on experience.

Effect of Amount of Use on Experience Quality

The literature on the relationship between amount of use and experience quality is voluminous. Much of the early wilderness visitor research either emphasized or included this topic. Most studies have (1) used quantitative survey techniques, (2) been conducted after the trip—often as much as two weeks or more, and (3) required visitors to generalize about their entire trip—as opposed to individual events. In addition, the dependent variable of experience quality has usually been assessed on an ordinal evaluative scale, from good to bad, big problem to no problem, acceptable condition or not, without providing much insight into *how* experiences are affected. Despite this reliance on evaluations from post-trip questionnaires, some studies have used qualitative techniques; some have explored influences as they occur; and some have gone beyond scaled evaluations of quality to understanding how particular attributes affect the nature of the experience. Differences in approach also reflect the dependent variable selected, whether relationships are assessed under hypothetical or actual conditions and whether the ultimate independent variable is use density or some measure of interaction among groups (such as encounters).

Assessments of conditions encountered—Some studies have assessed, under actual conditions, the extent to which the quality of the entire wilderness visit (often referred to as total satisfaction) declines as use density or encounters increase. Between 1970 and 1972, Lucas (1980) conducted the first of a number of studies of the density-satisfaction relationship based on actual experiences in wilderness environments. In the eight wildernesses he studied, the relationship between use density and satisfaction with the total experience was either

weak or non-existent. Subsequent studies in other places have generally come to the same conclusion (see reviews by Kuss and others 1990; Manning 2011). In a few cases there is a statistically significant inverse relationship, but the magnitude of effect is never pronounced. Where r^2 has been used, density and encounter measures have never explained more than 10% of the variation in total satisfaction.

A second approach, also based on evaluations of actual conditions experienced on each visitor's trip, involves asking visitors to focus their attention only on use density and then evaluate this single attribute, rather than the entire experience. A number of studies have asked visitors how crowded they felt. Crowding is assumed to be a personal negative evaluation of use density. Theoretically, if solitude is important to wilderness visitors, higher use densities should result in increased levels of crowding which, in turn, should be associated with reduced experience quality or satisfaction. Numerous studies have found substantial levels of perceived crowding, but density or encounters typically explain less than 10% of the variation in crowding (Kuss and others 1990; Manning 2011). Moreover, most studies report little or no relationship between crowding and evaluations of overall experience quality (Dawson and Watson 2000; Manning 2011). Vaske and Shelby (2008) provide a thorough review of 30 years of research on the crowding construct.

Much work has been based on the commonsense conclusion that increasing use should result in increased crowding, which if it violates norms for encounter preferences should lead to support for limiting use. A good example of results that are inconsistent with these premises is provided by a longitudinal study conducted in the Apostle Islands (WI)—since designated as wilderness. This study used a panel approach, contacting the same visitors each measurement period, so changes should not reflect displacement of dissatisfied users. Between 1975 and 1985, perceived crowding actually declined as use level doubled (Kuentzel and Heberlein 2003). Visitors became more tolerant of encounters; their norms for preferred encounters more than doubled. Between 1985 and 1997, however, perceived crowding increased despite relatively stable use and stable norms for encounter preferences.

In other studies, visitors have been asked to evaluate the severity of problems with seeing other people. Without exception, such studies report that problems with the number of people encountered in wilderness are not substantial—even in the most heavily-used destinations in wilderness. For example, in a recent study conducted in 13 wildernesses in Oregon and Washington, when asked about large numbers of day users, the mean problem severity, on a scale from 1 (not at all a problem) to 7 (big problem) was 2.2 on moderate use trails and only 2.6 on the most heavily-used wilderness trails in those states (Cole and Hall 2008a). Clearly, encountering large numbers of people does not have a substantial adverse affect on most wilderness visitors and the magnitude of adverse effect is not highly sensitive to use density. In that same study, Cole and Hall (2008a) found that one's "sense of enjoyment" declined as number of groups encountered increased, but r^2 was 0.007 (less than 1% of variance explained) and an increase in encounter

levels of 75 groups per day would cause just a 1 unit decrease in reported enjoyment on the 7-unit scale.

Numerous reasons for the apparent lack of relationship between amount of use and experience quality have been advanced. Some of these explanations have been methodological criticisms—particularly about lack of variation in total satisfaction measures, the need to remember how one felt several weeks ago, the need to condense an evaluation of an entire trip into a single rating, and, particularly, the limitations of generalizing across different individuals, many of whom may not be highly motivated to experience solitude. Wilderness visitors vary greatly in motivations, expectations and other characteristics likely to influence their response to any setting attribute such as use density (a subject reviewed in more detail below). The cross-sectional research designs used to address this issue have been unable to "factor out" all this variation. In essence, all the variation between individuals becomes "error", making it very difficult to detect relationships, within individuals, between density and experience quality.

In a study at Grand Canyon National Park (AZ), Stewart and Cole (2001) mitigated many of these methodological shortcomings by using on-site, daily diaries to study how the evaluations of individual visitors varied from day to day with use density. Analysis of resultant data showed highly consistent relationships between density and crowding, crowding and experience quality, and density and quality. Although consistent, the magnitude of influence was small. For example, for 60% of respondents there was a significant negative relationship between the number of groups encountered and experience quality—assessed using a five item measure modified from Ditton and others (1981). For 20% of respondents, there was a positive relationship between encounters and experience quality. For the average person with a negative relationship, encounters per day would have to increase from 1 to 80 per day to reduce quality 50%. Only five percent of respondents had strong negative relationships (defined as a slope greater than –1.0, equivalent to a 50% reduction in quality if encounters increased from 1 to 16 per day).

This study provides increased insight into the relationship between density and experience quality but does not alter earlier conclusions. For a very few people, use density has a strong adverse effect on experience quality. Some people respond positively as use density increases. Most wilderness visitors are adversely affected by meeting many other people but the effect of meeting many people on the overall quality of their experience is minor. Most people prefer to see few people—as the results of hypothetical studies indicate—but are not highly bothered when they cannot have their preferred experience.

Assessments of hypothetical conditions—Another approach is to ask visitors directly, but in a hypothetical manner, how they think different levels of interaction would affect their experience. Lucas (1964b) was the first to do this in wilderness—asking visitors to the Boundary Waters Canoe Area (MN) "how many canoeing and motorboating groups could you meet in a day before you would feel there was too much use?" As has often been found, results varied with who was asked as well as with the type of user encountered. Canoeists usually wanted to

see no motorboats and 0-5 canoes. Motorboaters usually said "no limit" for canoeists and 25-100 motorboats. This approach has since been operationalized in several different ways. Visitors have been asked about preferred numbers of encounters and maximum acceptable numbers of encounters. They have been asked to assess their likely response to different numbers of encounters, presented either verbally (Stankey 1973) or visually (Manning and others 1996). They have been asked to give their highest tolerable contact level (Shelby 1981).

In describing his results, Stankey (1973) casually described them as "norms regarding use encounters." It was Heberlein (1977), however, who proposed that the normative approach might be a worthwhile perspective for carrying capacity research. He promoted Jackson's (1965) return potential curve as a model for portraying visitor opinions about appropriate use levels as norms. Heberlein and Vaske (1977) subsequently developed return potential curves (later called impact acceptability curves) from visitor assessments of the "pleasantness" of encountering different numbers of groups. The point at which these curves crossed the neutral line—where the mean response to that number of encounters was neither pleasant nor unpleasant—was interpreted as a widely-shared encounter norm. This metric was proposed to represent the upper limit of what people will tolerate or accept (Vaske and others 1986), an interpretation that has been adopted in many subsequent research projects. Manning (2007, 2011) provides thorough reviews of results from research into norms related to amount of use.

Analysis of such data, referred to variously as satisfaction curves, preference curves, acceptability curves, or encounter norms, shows that most visitors prefer relatively low use densities and encounter levels. They perceive that their experience quality would be negatively influenced by large numbers of encounters and most are willing to identify a number of encounters beyond which conditions are unacceptable and managers ought to do something. These are the sorts of results originally anticipated by managers and many researchers, given that many people complain about encountering too many other people. However, it is important to note that (1) these are hypothetical self-reports, the validity of which has been questioned (Lee 1977; Williams and others 1992a) and (2) the dependent variable in this approach is "satisfaction with the number of people seen rather than satisfaction with the entire experience" (Shelby 1980). There is still little empirical evidence that encountering more people than one prefers (or considers acceptable) has a substantial adverse effect on the quality of most visitors' experiences. For example, among backcountry hikers in Great Smoky Mountains National Park (TN-NC), 61% of the respondents whose encounter norms were exceeded indicated that number of encounters did not detract from the quality of their experience (Patterson and Hammitt 1990).

Effects on what people experience—Relatively few studies have assessed the effect of any attribute on what people actually experience in wilderness. Lucas (1964b) found that visitors' sense that they were in wilderness declined as use density increased and, as noted above, studies have reported

that people feel more crowded when use density is high. In a variation on this approach, Hammitt and Rutlin (1995) explored the relationship between encounters and "privacy achieved" among visitors to Ellicott Rock Wilderness (SC) and found that there was an inverse relationship between number of encounters and privacy achieved. They did not attempt to assess the extent to which visitors considered privacy achieved to be an important aspect of their experience. In Aravaipa Canyon Wilderness (AZ), Moore and others (1989) found that four of eight types of wilderness experience declined as social contacts increased: feelings of solitude, freedom and unspoiled wilderness, as well as the sense that no one had been there before. One's sense of discovery, security, untamed wilderness and danger were not affected by use density.

In a study of visitors to Auyuittuq National Park in Canada, Watson and others (2007) identified five prominent dimensions of wilderness experience. For two of these dimensions—taste of the Arctic and challenge and accomplishment, the degree to which these dimensions were experienced increased as encounters with others decreased. The paper did not report how substantial these effects were, however. Connection with nature, isolation in nature, and learning and appreciation did not vary with use density.

The most thorough study of use density effects on dimensions of experience was conducted in the Alpine Lakes (WA) and Three Sisters (OR) Wildernesses. The experiences of visitors to very high use trails (typically > 100 people/day) were compared with those of visitors to moderate use trails (typically 15-20 people/day) by asking about the degree to which each of 71 different experiences was attained (Cole and Hall in press a). Only nine of the 71 items were experienced more in less densely used places: a sense of being away from the modern world, a feeling of remoteness, a sense that surroundings were not impacted by people, solitude, not having solitude interrupted, peace and tranquility, quiet, getting away from crowds for awhile and feeling isolated. Most of these items are more descriptors of the setting and conditions that were encountered than of the psychological outcomes of encountering those conditions. For example, although visitors to very high use trails experienced less privacy than visitors to moderate use trails, there was no difference related to use level in ability to achieve the beneficial functions of privacy—release and personal growth (Cole and Hall 2010a). Nor were visitors to very high use trails any less able to experience the restorative benefits of a wilderness visit (Cole and Hall 2010b).

In a related study at Snow Lake in the Alpine Lakes Wilderness (WA), Cole and Hall (in press b) compared experiences of visitors on weekends (typically 200 people/day) to those of visitors on weekdays (typically 50 people/day). As they found elsewhere, use density had a much stronger effect on the setting attributes that people encounter than on on-site behavior, affective or psychological experiential outcomes or appraisals of the entire visit. Despite a four-fold difference in use density, perceived crowding was only 20% higher on weekends and the degree to which people were "annoyed" with other people was only 7% higher. Four of five experiential dimensions, absorption-connection to nature, rejuvenation, personal

accomplishment and personal reflection, were experienced to the same degree on weekends and weekdays. Only wildness-remoteness was experienced significantly more by weekday visitors than by weekend visitors and even for this factor the difference between weekdays and weekends was only 0.4 units on a 6.0 unit scale. Differences between high and low use times almost completely disappeared when visitors integrated their perceptions and concerns about other people with all the other aspects of their trip—most of which were positive, persistent and did not vary with use density. Interviews suggest that such positive attributes as Snow Lake's scenic beauty were both more important to the quality of the visitor experience and more enduring than the number of other visitors (Cole and Hall in press b).

Effects of the situational context and characteristics of those encountered—A number of studies, conducted both inside and outside wilderness, make it clear that the effect of use density on experience is influenced by both characteristics of those encountered and where encounters occur (Manning 2011). One common finding is that the adverse effects of encountering others is less when those encountered are perceived to be much like oneself (Lee 1977). Hence, people traveling in small backpacking groups are typically affected more when they encounter groups with horses than other backpackers and when they encounter large groups as opposed to small groups (Stankey 1973). Encounters also have a more adverse effect on experience when they occur in campsites rather than on the trail (Lucas 1980) and when they occur in remote parts of a wilderness (Stankey 1973), presumably where fewer people are expected or considered appropriate.

Effects of Other Attributes on Experience Quality

As the preceding paragraph suggests, use and user characteristics other than amount of use can influence experiences. Beyond attributes of the social setting, experiences can be affected by the biophysical setting and the managerial setting. Experiences can be influenced by personal attributes of wilderness visitors and by the events that happen on a trip. Although many of these influential attributes have received little empirical attention, some information can be gleaned from a handful of studies that have employed both quantitative and qualitative techniques, exploring both actual field conditions and hypothetical situations. Much more attention has been devoted to "problems"—attributes that detract from the experience—than to attributes that enhance experiences.

Assessments of conditions encountered—In a number of visitor surveys, visitors have been asked how they felt about the conditions they encountered, often on scales of "like" to "dislike" or "added to my experience" rather than "detracted from my experience." Often these questions focus exclusively on detractors and ask visitors to evaluate the severity of problems created by particular attributes. This approach has the advantage of asking visitors to judge situations they actually experienced on their trip but it can conflate attribute importance with the frequency with which an attribute is encountered. A potentially influential attribute might be overlooked simply because it was not encountered.

Studies have consistently found that the greatest source of dissatisfaction is litter (Stankey and Schreyer 1987; Moore and others 1989; Cole and others 1995; Hockett and Hall 1998). Most other "problems" are of slight importance and vary from area to area. Trail wear and tear, trampled areas from camping and walking, and impacts from recreational packstock were at least as problematic as large numbers of users in wilderness areas in Oregon and Washington (Cole and Hall (2008a). Noisy and inconsiderate groups were more of a detractant in the Shenandoah Wilderness (VA) than the number of people encountered (Hockett and Hall 1998), while close by in Shining Rock Wilderness (VA) large numbers of people were more problematic than rowdy, noisy or large groups (Cole and others 1995). Rules, regulations and other management actions are seldom considered to be much of a problem (Cole and Hall 2008a), but restrictions on access have been shown to displace wilderness visitors (Hall and Cole 2000). The most important positive effects on experience in the Shenandoah Wilderness—of those items asked about—were solitude, waterfalls and wildlife (Hockett and Hall 1998).

A richer understanding of influences, particularly positive ones, can be obtained through interviews. Hall and others (2007) conducted interviews at three popular destinations in the Mt. Jefferson (OR), Eagle Cap (OR) and Alpine Lakes (WA) Wildernesses. When asked "what has been key to your experience out here," positive influences were mentioned much more frequently than negative influences. The most prevalent positive influences—mentioned by two-thirds of visitors—were aspects of the natural environment, the fact that it was scenic, undisturbed, with natural smells and sounds. Other commonly mentioned positive influences were peace and quiet, relatively few other people, good weather, engaging in activities one enjoys, and positive interactions within one's own social group.

Although about 60% of participants mentioned at least one negative influence on their experience, only a few attributes were mentioned by more than a few people. Bad weather, bugs and fatigue or sore feet—attributes managers cannot control—were mentioned by about 20 percent of participants. The one common negative influence subject to managerial control—crowding and rude or inappropriate behavior—was mentioned by 26% of participants. Other negative attributes mentioned by a few people were airplanes, horses, regulations, litter, campsite impacts and illegal behaviors, such as having campfires where they are not allowed.

In addition to negative attributes being less-frequently mentioned, interviewees often downplayed negatives, noting that "they weren't that big a deal." As some research suggests, experience quality can be enhanced by the overcoming of conditions that are unexpected or even undesirable (Patterson and others 1998). Another insight from the interviews—suggesting why negative attributes seldom are judged to be much problem—regards the temporal distribution of positive and negative influences. Typically, wilderness visitors are perpetually surrounded by substantial positive influences, the natural

environment, peace and quiet, engaging in enjoyable activities and interacting with other group members, while negative influences are generally confined to isolated instances.

Assessments of hypothetical conditions—Visitors have also been asked to evaluate the importance of different attributes regardless of whether they were problematic on their recent wilderness visit. Evaluations are hypothetical (relevant to how respondents *might be* affected) rather than actual (relevant to how respondents *were* affected). Roggenbuck and others (1993) asked visitors to the Caney Creek (AR), Cohutta (GA) and Rattlesnake (MT) Wildernesses how much they "care about" such attributes as "the amount of litter I see" and "the number of hikers who walk past my campsite." With the exception of "number of wild animals" seen, they focused on negative attributes. The most important attributes were site impacts, particularly litter and tree damage at campsites, and human-caused noise. Wild animal sightings were also important, and encounters with other groups were less important. At Aravaipa Canyon Wilderness (AZ), Moore and others (1989) also found that litter was a major experience detractor, along with graffiti, feces and low-flying aircraft. Seeing animals, along with opportunities for recreational activities, was a major experience enhancer.

One criticism of this approach is that respondents have little guidance regarding what conditions they are evaluating. When asked about tree damage, are they imagining a clearcut or a few nails in trees? To overcome this limitation, Cole and Hall (2009), in the Alpine Lakes (WA) and Three Sisters (OR) Wildernesses, provided three levels for each attribute (for example, "no litter," "a few pieces of litter," and "lots of litter in many places"), asking for ratings on a scale from "adds a lot to the experience" to "detracts a lot." Moreover, they reasoned that the most important attributes were those with the largest variation in evaluations among levels. Again, litter was rated the most important attribute. Human sounds were considered a major detractant and wildlife sightings added substantially to the experience. In these places, the level of interaction with people outside one's own group at campsites was considered to have a substantial adverse effect on experience quality.

Effects on what people experience—Less is known about how many of these attributes influence what visitors actually experience. At Aravaipa Canyon Wilderness (AZ), Moore and others (1989) report that the presence of human feces or toilet paper substantially reduced one's experience of both untamed wilderness and unspoiled wilderness. This ability to experience untamed and unspoiled wilderness was reportedly not affected by evidence of campfires, damaged trees and vegetation, livestock manure, wildlife, low flying aircraft and firerings. The presence of litter, livestock manure and damaged trees and vegetation affected one's "feeling that no one had been here before," while feces, campfires, fire rings and wildlife did not. None of these attributes influenced feelings related to discovery, danger or security.

Although not working in wilderness, Lynn and Brown (2003) asked respondents to assess the effect of six recreation impacts (trail erosion, trail widening, trail muddiness, tree and plant damage, fire rings and litter) on each of four dimensions of experience: solitude, remoteness, naturalness and artifactualism (absence of human impact). Litter was reported to have the greatest adverse effect on all experience dimensions, while trail muddiness detracted least. Effects on artifactualism were most pronounced, while effects on solitude were least pronounced. From interviews with canoeists at Juniper Prairie Wilderness (FL), Watson and Roggenbuck (1997) identified four important dimensions of the wilderness experience: interaction with nature, challenge/primitive way finding, interaction with people and timelessness. Details from the interviews suggested attributes that influence these experience dimensions. For example, dealing with overhanging trees along the canoe route and wildlife sightings were often mentioned as major influences on interaction with nature.

On-site wilderness experiences can also be affected by off-site attributes. For example, at Auyuittuq National Park in Canada, Watson and others (2007) report that visitors' ability to experience two important dimensions of experience—taste of the Arctic and connection with nature—was dependent on the quality of pre-trip planning information.

Effects of visit and visitor characteristics—Although mostly anecdotal in nature, peoples' experience will clearly be affected by visitor characteristics (such as individuals' motivations and expectations), visit characteristics and even events that happen on the trip that are unrelated to setting attributes. Whether weather is good, bad or even life-threatening will have a profound effect on experience. Or consider the difference in experience of a group that is constantly bickering and fighting, in contrast to a group that builds life-long bonds of intimacy on the trip. Events not within the control of management are among the most profound shapers of the nature of experience and its quality, reinforcing the conclusion that managers cannot ensure that certain experiences will be attained or that visitors will be satisfied with their experience. They can only provide setting attributes that will protect opportunities for the types of experiences most enhanced by those particular setting attributes and information likely to prepare visitors for what they will experience.

Mode of travel also has a profound effect on experience. The experience of someone traveling on horseback must be different, at least in some ways, from someone who is backpacking. Experience will also be affected by whether one is visiting alone or in a group and whether the group consists of friends, family or other members of some educational or therapeutic group. Although experiences of different types of group have been studied (Ewert and McAvoy 2000; Dawson and Russell in press), comparative studies of experience are lacking.

One visit variable that has received some empirical attention is length of stay. Borrie and Roggenbuck (2001) explored how experience varies among phases of a wilderness trip, a diversity and richness of experience that is only possible on longer wilderness trips. Cole and Hall (2008a, in press a) asked both day and overnight visitors to wildernesses in Oregon and Washington the degree to which they attained certain experiences. There were more significant differences in experience related to length of stay than to amount of use. Overnight visitor

assessments of experience attainment were higher than day user assessments for all attributes that differed significantly, with the exception of relaxing physically and getting exercise. This suggests that length of stay may influence the intensity of experience more than the types of experience that are attained. Nevertheless, there are clearly certain experiences, such as setting up a tent or watching the night sky, that are largely restricted to overnight visitors.

Mediating Effects of Visitor Characteristics

Studies conducted both inside and outside wilderness show that the effect of use density and other attributes on experience varies greatly among individuals. That is, attribute effects on experience are mediated by the personal characteristics of visitors (Manning 2011). Indeed, it is important to remember that "experience is not merely a psychological *reaction* to the setting (in a stimulus-response sense), but something *created* by the individual or group through active engagement with the setting (Williams 2007, p. 30). As was discussed earlier, particularly important are visitors' motivations and expectations, prior wilderness experience, and place attachment.

It stands to reason that use density, for example, would be a more salient attribute for someone motivated to experience solitude and tranquility than for someone whose primary motivation for visiting wilderness is to get exercise. Indeed, a number of studies have shown that the effect of use density on experience is mediated by people's motivations. For example, in Yosemite National Park (CA), although use density explained only 7% of the variation in perceived crowding, the addition of experiential motives increased the explained variance to 23% (Absher and Lee 1981). In Oregon and Washington wildernesses, Hall and others (2010) clustered visitors into three groups based on motivations and wilderness involvement. For visitors with low levels of involvement and wilderness-oriented motives, the number of groups encountered had no effect on experiencing enjoyment, a sense of being in wilderness, solitude or freedom. For highly wilderness-involved and motivated visitors, all four of these experiential qualities diminished as number of encounters increased. An intermediate cluster experienced decreased solitude and sense of being in wilderness, but no difference in enjoyment or freedom.
One's attitudes toward wilderness and the extent to which they are congruent with the values espoused in the Wilderness Act—sometimes referred to as wilderness purism—are also important mediators. In the Cohutta Wilderness (GA), wilderness purists were particularly concerned about—and therefore more likely to have their experience affected by—a range of attributes reflective of human impact, natural features and processes, solitude, management confinement, primitive travel and management-aided travel (Shafer and Hammitt 1995).

The mediating effects of prior wilderness experience are more complex. It has been postulated that more experienced users should be more sensitive to attributes such as use density and low levels of impact, because more experienced users have more refined tastes and were able to experience places before they became crowded or impacted (Manning 2011). However,

with experience comes more realistic expectations and one's expectations strongly mediate the influence of attributes. In the backcountry of Denali National Park, for example, the variation in perceived crowding explained by expected encounters was substantially greater than that explained by actual encounters (Bultena and others 1981b).

Indeed, results regarding the mediating effects of experience have been inconsistent. Manning (2011) suggests that most studies have found that sensitivity to use density increases with experience. However, prior experience had no effect on sensitivity to use density in studies conducted in Yosemite National Park (Absher and Lee 1981), or the Lee Metcalf (MT) and Desolation (CA) Wildernesses (Stankey 1980). In the Alpine Lakes (WA) and Three Sisters (OR) Wildernesses, more experienced visitors were much more sensitive than less experienced visitors to the influence of many different attributes on their experience, from litter to human sounds and campsite proliferation (Cole and Hall 2009). However, prior experience had no effect on perceptions of wilderness conditions in the High Peaks (NY) and Pemigewasset (NH) Wildernesses (Peden and Schuster 2008).

One's symbolic and emotional relationship to place can also mediate influential effects on experience. As with the effects of prior experience, effects of place attachment are complex, involving increased sensitivity, more realistic expectations and a lack of options for substitution. In the Caney Creek (AR), Cohutta (GA), Upland Island (TX) and Rattlesnake (MT) Wildernesses, Williams and others (1992b) found that visitors who were more sensitive to ecological impacts and horse encounters were more place attached than less sensitive visitors; however there was no relationship between place attachment and sensitivity to sight and sound intrusions or hiker encounters. Sensitivity to all four types of impact was more strongly related to attachment to wilderness generally than to place attachment.

Place identity, one's symbolic and emotional attachment to place, differs from place dependence, the functional values of a place to an individual (Manning 2011). In a study conducted on the Appalachian Trail, hikers with high place identity scores were more sensitive to a wide range of adverse effects on experience: trail development, user impact, depreciative behavior, perceived crowding, user conflict and human encroachment (Kyle and others 2004 a, b). However, those with high place dependence scores evaluated these conditions less negatively, Conceivably, those with high place dependence acquiesce to conditions, since they perceive there are no other places they can go. At Table Rock Wilderness (OR), White and others (2008) found no relationship between either place identity or place dependence and perceptions of recreation impacts.

Coping Behaviors and Human Adaptability

Humans are highly adaptable and they learn to cope with adverse conditions in wilderness, as they learn to cope elsewhere. This adaptability can explain why the same people who complain about crowding and who encounter conditions that differ substantially from what they prefer or consider

acceptable, still consider such conditions to be only a minor problem and do not support use restrictions intended to improve conditions. Reviewing a series of studies in Oregon and Washington wilderness, Cole and Hall (2008b) estimate that 25-30% of wilderness visitors do not care much about the use levels they encounter in wilderness, probably because they are not looking for solitude. Another 5-15% are highly bothered—enough to potentially be displaced at certain times from crowded places. Most visitors are adaptable, however. They would rather not encounter high use densities, but they do and in response "they learn; they plan; they adjust their expectations; they cope; they rationalize; they view things in relative terms—rather than absolutes—they say "this place offers more solitude than Seattle" rather than "this place provides no solitude;" they make trade-offs" (p. 129).

Empirical studies in wilderness show that visitors frequently use coping strategies. In the Desolation Wilderness (CA), 44% of visitors were either temporally or spatially displaced. They changed the length or route of their trip to avoid overuse (Stankey 1980). Subsequent studies suggest that many visitors make minor adjustments to their temporal and spatial use of wilderness—avoiding crowded places on weekends if they can, moving a little further down the lakeshore to get away from crowds, or selecting a trail other than the most crowded one (Hammitt and Patterson 1991; Johnson and Dawson 2004; Hall and Cole 2007). However, intersite displacement is rare (Kuentzel and Heberlein 1992). In Oregon and Washington wildernesses, only 3% of visitors reported they had completely stopped using any place in wilderness because it was too crowded, with another 4% being displaced by some other use-related condition or experience, usually stock use, vandalism or rude, inconsiderate behavior (Hall and Cole 2007).

Visitors also use a variety of cognitive coping strategies when they encounter conditions that are incongruent with their desires. They can alter their expectations, a process referred to as "product shift" (Heberlein and Shelby 1977). Or they can employ a wide array of rationalizations for suboptimal conditions, including avoiding the problem, minimizing its severity, making positive comparisons or trying to turn a negative into a positive, and acquiescing to the situation (Schuster and others 2006; Cole and Hall in press b). Visitors who are more sensitive to crowding and have lower encounter norms were more likely to use coping behaviors in Great Smoky Mountains National Park (TN-NC) (Hammitt and Patterson 1991). This might explain the surprising finding that those employing coping strategies were less satisfied with their experience (Johnson and Dawson 2004; Schuster and others 2006).

Summary

Although much remains to be learned about the processes by which visitors experience wilderness, there can be no doubt that many attributes encountered on the visit profoundly affect the nature and quality of wilderness experiences. This is true whether one views experience more as a reaction to the setting or something created through engagement with the setting. However, the idiosyncratic nature of experience makes generalization potentially misleading. For one visitor, encounters with others may destroy the experience, while someone else may find encounters enjoyable. The same person might find one encounter positive and another negative. An expanse of alpine tundra might be beautiful to one person and distasteful to another, a source of inspiration for one person and a source of fear for another. Nevertheless some broad generalizations seem warranted.

First, wilderness managers have relatively little ability to control most of the things that most profoundly affect wilderness experiences. Through the provision of pre-trip information they can perhaps have some influence on the motivations, expectations and attitudes that each person brings to the wilderness engagement, but they cannot control many of the things that transpire on the trip—weather, within-group social interactions, and so on. Even among setting attributes, many of the most important attributes—the flora and fauna, free-flowing waters, natural sights, and smells and sounds—are not subject to managerial control. Given this, one important insight is that managers can only protect settings and, by doing so, provide opportunities for particular kinds of experiences. They cannot provide, protect or guarantee that everyone will have certain experiences. In the language of the Wilderness Act, they can provide outstanding opportunities for solitude but they cannot guarantee that everyone will experience solitude.

Second, although high use density and use-related impacts, particularly litter, are probably the most serious threats to experiences that are subject to managerial control, positive influences on experience are much more prevalent than negative influences. Moreover, the attributes that positively influence experience—changing views, connecting with nature, interacting with one's social group, and many more—tend to be persistently present throughout much of the trip, whereas most negative influences occur infrequently and for short duration. This difference in the temporal distribution of positive and negative influences may have much to do with the fact that even attributes visitors complain about, such as crowding, are seldom considered substantial problems and have little effect on the overall quality of visitors' experience. As long as management does not do things to disrupt the ability of people to experience the natural environment in a primitive setting, in the company of others in their social group, virtually all visitors will have what they consider to be positive and high quality wilderness experiences.

Third, most wilderness visitors are highly adaptable and able to cope effectively with suboptimal conditions. They learn about the conditions they are likely to encounter and either adjust their expectations or they choose less crowded times or places, if this is convenient and better meets their needs. Once on-site, they adapt behaviorally and cognitively to what they encounter, minimizing the degree to which negative influences detract from the overall quality of the experience. As was explored in the section on the nature of wilderness experiences, experience quality is more than the degree to which a visitor's expectations are met. "People make their own experiences, they shape and adapt the situation, and they employ skills and knowledge to create their own satisfaction" (Williams 2007, p. 38).

Stewardship of Visitor Experiences ___

The primary contributions of wilderness researchers regarding actions managers should take to protect wilderness experiences have involved development of decision-making frameworks, typologies of management strategies and the organization of experiential knowledge about these strategies (Manning and Lime 2000; Dawson and Hendee 2009). Little empirical research has been conducted on the efficacy of particular protective strategies, to a substantial degree because there is little consensus on what protection of experience quality means. There have been studies of the efficacy of actions with more narrowly-defined goals. For example, if it is assumed that visitor experiences are better protected when use is widely distributed rather than concentrated, there has been work on the efficacy of actions designed to disperse use (Roggenbuck and Berrier 1981; Krumpe and Brown 1982).

Visitor attitudes toward management actions have been well-studied. Although attitudes vary some from place to place and substantially among individuals, several generalizations seem warranted. First, not surprisingly, there is much more support for actions that are not restrictive (such as education) or that only restrict certain groups (such as limits on large groups or on stock) than there is for restrictions that affect everyone (such as use limits). There is also more support for restrictions on behavior than restrictions on access (Cole and Hall 2008a). Second, restrictions are supported more in concept than in reality. For example, in a question asked in many different wildernesses, majorities always agree that "limits on use should be imposed in the future when overuse occurs." However, even in some of the most heavily-used wildernesses in the system, there is little support for limiting use now (Cole and Hall 2008a). Visitors are also more likely to support restrictions for the purpose of limiting environmental impacts than to protect visitor experiences (Cole and Hall 2008a). Third, most visitors are highly supportive of the current management regime, regardless of what it is. For example, despite general lack of support for implementing use limits where access is currently not restricted, most visitors to places that have use limits support those limits (Bultena and others 1981a). This reflects, in part, the fact that those people least tolerant of or capable of dealing with restrictions have been displaced (Hall and Cole 2000).

Science and Management

Despite the 50 years of research on wilderness experience reviewed in this paper and other papers in these proceedings, wilderness managers still struggle to decide how to protect the quality of visitor experiences and keep asking for new research to help them with such decisions. This may be asking too much of research, however (Williams 2007). Managers often make the mistake of assuming too much responsibility for experience quality by failing to recognize the degree to which visitors create their own experiences. To return to the notion of situated freedom introduced earlier, managers can try to maintain some basic setting conditions for the kinds of experiences that wilderness should provide (such as solitude and primitiveness) without prescribing precise limits on conditions and visitor behaviors. Part of the manager's task is to find ways to enhance the capacity of visitors to create their desired experiences and adapt to the varied conditions they encounter. In this sense, a quality experience is not a preformed deterministic result of setting conditions; it can only be understood in the context of the skilled improvisational performance by which the visitor responds to the conditions encountered.

Reframing experience as being reflective of performance suggests different strategies for enhancing wilderness experiences. Rather than having management focused almost exclusively on managing setting conditions, managers can devote greater attention to visitor preparation and skill development that allows them to optimize their performance in a wide range of conditions—through the provision and management of information. Although providing information is a well-established management technique, most of the information provided is designed to persuade visitors to behave in the way managers want them to behave (such as practicing Leave No Trace)(Manning 2003). More attention should be given to providing information designed to enhance experiences in wilderness, information that can positively influence motivations, expectations and attitudes, and possibly even shaping the information that visitors receive. Too much information, of particular kinds, can decrease opportunities for self-discovery and self-sufficiency, for example.

We also should recognize that managers are effectively stewarding wilderness experiences by not doing many of the things managers do elsewhere. Connecting with nature in scenic and undeveloped landscapes, in the company of one's own group, are the central components of a quality experience in wilderness (Hall and others 2007). All managers have to do to facilitate this is to not allow uses that are generally prohibited in wilderness (such as logging and motorized use), not build developments or facilities and provide access for recreation. We say this not to suggest that managers do nothing active to steward experiences but to recognize that much that is valued about experiences follows from simply not permitting many of the things that are generally not allowed in wilderness.

Williams (2007) points out that managers often seek technical solutions to what really are social and political conflicts over meanings, values, and uses, conflicts more likely to be resolved by bringing citizens together to work out their differences than through research on wilderness experience. "A greater appreciation is needed of the limits of a research approach to solving specific management problems in specific situations" (p. 38).

Who and What to Manage For

Two of the primary conclusions of the research reviewed in this paper illustrate the limitations of science in answering questions about how to protect visitor experiences in wilderness. Studies of the nature of the experiences people have in wilderness illustrate how diverse, situational, and idiosyncratic they are. Experience varies greatly in terms of what people

seek, attain and create, as well as what it means to them. One person's definition of quality differs from another person's definition. Appreciation of this variety has only increased as researchers explore the process by which experience is created, apply a relationship metaphor to understanding experience and delve more deeply, through in-depth interviews, into the meanings people attach to experience. But given this diversity of experience and opinions about what constitutes quality, how do managers decide who they are managing for?

Another important conclusion of this review is that wilderness visitors—like all humans—are highly adaptable. Although adaptability does contribute to human well-being, given the inevitability of change in the world, it does complicate questions about how to protect high quality wilderness experiences. As Dustin and McAvoy (1982) point out, the adaptable nature of humans guarantees that "regardless of the types of opportunities provided, a majority of recreationists will be satisfied with them" (p. 53). If wilderness visitors will be satisfied almost regardless of what management does, how do managers decide what they should be managing for?

Managers have several options regarding decisions about who and what to manage for in terms of visitor experiences. They can base management on tenets of the Wilderness Act and protect setting attributes that should ensure outstanding opportunities for solitude and primitive and unconfined recreation. This might mean, among other things, maintaining low use densities and minimal levels of development, regardless of what visitors want. Another option is to identify wilderness purists and then, through visitor surveys, identify the experiences and setting attributes purists think are appropriate and manage for these. The outcome of this option is not likely to differ practically from simply managing according to the tenets of The Wilderness Act, without relying on visitor studies. This approach seems vulnerable to the criticism Burch (1981) levied against carrying capacity research as one of "organized irresponsibility where managers point to the 'scientific' data as reason enough for their preferred decisions, and the scientists have the pleasure of both defining and 'proving' the value of certain wildland policies held by personally compatible social strata" (p. 224).

Managers could give preference to the average visitor, for example by using the results of normative research and defining standards on the basis of averages. This approach seems vulnerable to the criticism that the average visitor does not exist and, if values are widely divergent, managing for the central tendency may not protect anyone's values (Shafer 1969). Another option is to manage for any of many segments of visitors that might be identified through some sort of cluster analysis. But which visitor type should managers give preference to? Science can help managers approach this question, frame it and think through options, but science cannot provide a definitive answer.

Given their mandate to serve all people, it may seem undemocratic to decide who and what to manage for. This dilemma can be alleviated by embracing public engagement and providing more options for constituency collaboration in decision-making. Research can contribute by improving our understanding of different constituencies, with varied relationships to settings and divergent ideas about quality experiences and by developing and evaluating more participatory approaches to management (Williams 2007). Equally important is managing for diversity—with the goal of providing as diverse a system of appropriate environmental settings as possible (Dustin and McAvoy 1982) or a system of diverse settings that meets the needs and desires of a diverse population. This does not alleviate the need to decide, for specific places, which visitor group to give preference to and what conditions to manage for. But if different decisions are made in different places, in a coordinated manner that meets the needs and desires in the population, protection of quality should be ensured (Cole 2011).

Once managers and policymakers get beyond the hope that science can help them make political decisions about who and what to manage for—and they find some other means of making such decisions—the insights from wilderness visitor studies can better contribute to decision-making. Although much more remains to be learned, 50 years of research has enriched our understanding of the variety of visitors out there, the diverse ways they experience wilderness, and the wide-ranging ways such experiences enrich their lives and well-being. It provides insight into the types of settings that protect and enhance certain types of experiences and the likely efficacy of actions that might be taken to steward settings and experiences.

Managing for Solitude

Much of the controversy regarding stewardship of wilderness experience revolves around the issue of managing for solitude. Should managers restrict and limit use in order to protect against the erosion of opportunities to experience solitude? Since no other topic or question has received as much attention in the visitor experience literature, we conclude this review with our view of what research on this topic implies regarding management. This topic provides an example of the limitations of science and the confusion between technical solutions and socio-political decisions. The results of visitor studies can and have been used to bolster arguments for restricting and limiting use. Many of the studies reviewed earlier indicate that where use density is high, many wilderness visitors feel at least somewhat crowded, report that their solitude is periodically interrupted and that conditions are less than ideal. Their preferences and norms for encountering other people are often violated. Other results—sometimes from the same studies--bolster arguments against restriction, however. Problems with too many other people are seldom considered even moderately severe. Use density has little effect on evaluations of experience quality. And relatively few visitors support limiting use to protect solitude, if they are informed that their ability to gain access will be affected. Interviews suggest that when visitors consider the costs and benefits of use limitation, most conclude that costs (restricted access) exceed the benefits (a low use density experience).

The results of visitor studies also suggest likely explanations for these seemingly divergent conclusions. Despite its centrality

in the language of the Wilderness Act, most people consider a high degree of solitude to be less critical than experiencing scenic, natural-appearing, undeveloped landscapes and having meaningful interactions within one's own group. These latter experiences are pervasive and ever-present, in contrast to the episodic nature of having one's solitude interrupted. Moreover, they can be attained as long as access is provided, essentially regardless of use density. Most people learn to adjust their motivations and their expectations for what they will encounter and to cope with what occurs. A detailed reporting of results—going beyond measures of central tendency—show that these conclusions do not apply to everybody. Although the majority of visitors who encounter high use densities in wilderness oppose use limits to reduce densities and increase opportunities for solitude, some visitors support limits. Some visitors are highly motivated to experience uninterrupted solitude and report that their wilderness experience is severely degraded by having to cope with crowded conditions.

To generalize across visitor studies, a high degree of solitude and the very low use densities that facilitate solitude are desired but not critically important to most wilderness visitors. Most visitors prefer the freedom to choose where and when they can visit wilderness to having managers ensure opportunities for a high degree of solitude by limiting use. This leaves managers of places where use pressure is high with a difficult decision. Should they manage for the wishes of the majority of visitors and not limit use or should they maintain very low use densities, by limiting use, even if only a minority of users supports this approach? The rationale for the latter choice would be that the Wilderness Act mandates a setting characterized by a very low use density, regardless of the opinions of most users. Of course, this does not have to be an all-or-nothing decision. Perhaps use limitation could be implemented only in the places with the very highest use densities. Few would argue with the need for use limits on Mt. Whitney (John Muir Wilderness), on the Middle Fork of the Salmon River (Frank Church-River of No Return Wilderness) or popular entry points in the Boundary Waters Canoe Area Wilderness. In addition, different choices can be made in different places. Most of the wilderness system is likely to remain lightly used without use limitation. But perhaps use limits should be implemented even in some lightly used wilderness to provide extremely low use density opportunities. Conversely, perhaps use should be limited in some popular wilderness areas and avoided in other popular areas, to provide ready access to the benefits wilderness recreation provides.

Fifty years of visitor experience research has clarified these choices and improved our understanding of the likely consequences of management choices—what is likely to happen, who will benefit, and whose interests will be harmed. However, the ultimate decision is political rather than technical, reflecting a choice among values. Finally, we should note that these decisions are not trivial; they will determine the types and magnitude of benefits that flow from wilderness. We lament the fact that almost 50 years after passage of the Wilderness Act, there is still little meaningful policy to help wilderness managers make these decisions (Forest Service 2010). Rather than being made on the national stage, decisions are left to the discretion of low- to mid-level managers, who struggle with personal biases and political pressures to make wise decisions. In our opinion, this policy vacuum is a much greater barrier to progress in visitor experience stewardship than the need for more science to assist in policy development.

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