

# ATTITUDES TOWARD WILDERNESS AND FACTORS AFFECTING VISITOR BEHAVIOR: A STATE-OF-KNOWLEDGE REVIEW

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## ABSTRACT

*An understanding of user attitudes is essential to effective wilderness management. This review outlines historical and current societal and individual attitudes toward wilderness, reasons for participating in wilderness, factors affecting wilderness behavior (including attitudes toward management, crowding, and conflict), and how information and education affect behavior.*

*Visitors usually have distinct attitudes, though they vary considerably, and desire a role in the management process. Their views are increasingly important in the decision-making process. Research has a vital role in validating visitor input and presenting results to management in a timely and useful manner.*

## INTRODUCTION

How do people perceive wilderness? What factors influence their decisions to visit wilderness and what they do once there? What is the role of visitor attitudes and perceptions about wilderness in the management of these areas? Such questions underlie efforts to understand the meaning and significance of wilderness in society today.

In this paper, we review the state of knowledge regarding attitudes toward, and behavior within, wilderness. We are concerned with how people (typically, but not necessarily, visitors) feel about wilderness—the setting, use, and management. The actual behavior of wilderness recreationists—the types and lengths of trips, spatial and temporal patterns of use, and the activities in which people participate—is described in the review paper by Roggenbuck and Lucas (this proceedings). Our focus is on the factors that **influence** behavior—perception, education and information, group pressures, and so forth.

Because attitudes act as one influence on behavior, an understanding of their direction, intensity, strength, and distribution across the relevant population are all essential to effective wilderness management. Feedback from well-designed social surveys can provide a better understanding of the beliefs, ideas, and concerns held by visitors and other citizens. Such data also can help dispel the biases and misconceptions that arise from selective perception and contact (Lucas 1980).

We have focused our literature review on material dealing with the attitudes and behavior of individuals using environments characterized by relatively low use densities,

few facilities, and where other resource development activities were prohibited or greatly restricted.

Many of the findings about the recreation behavior process that we report here have their roots in work done in nonwilderness settings. Wilderness and its visitors exist within a complex, interacting system of recreation environments; the institutional labels applied to such areas often have little bearing on how they are perceived and used. Movement within this system is fluid over both space and time. Indeed, it is the images and conceptions of wilderness and their influence upon visitors' use that serve as the focus of this review.

The presentation will initially examine the formation and evolution of societal attitudes toward wilderness. These broad, cultural conceptions have obvious influences on individual perceptions; they serve also to highlight the continually shifting nature of the perceived relationships between society and nature. We then shift to a more specific level of analysis, examining the motives underlying wilderness participation and the general question of why people seek out these settings (this issue is explored in more detail in the paper on wilderness benefits in these proceedings by Driver and others). We then explore environmental perception, focusing on how the images people have about wilderness are formed and modified and how they affect behavior. Next, we review the breadth and distribution of opinions held by wilderness recreationists toward management actions and policies that have been, or might be, implemented. Finally, our review examines conflict in the wilderness setting and the general literature on crowding and carrying capacity.

We close with a brief analysis of the extent to which research findings regarding attitude and behavior have been applied. We also suggest areas of needed research.

## EVOLUTION OF SOCIETAL ATTITUDES TOWARD WILDERNESS

We begin our review of America's disposition toward wilderness at the society level. A society's conception of its environment and the relationship between itself and that environment are a product of a variety of experiences and influences. The attitudes about, and the behavior toward, wilderness in the United States reflect this: to fully understand modern society's view of wilderness, one needs to understand something of the socio-cultural history out of which the country and its people evolved.

## Early Conceptions of Wilderness

Nash's "Wilderness and the American Mind" (1982) provided us with an excellent summary of Old World images of wilderness that served as a frame of reference for early American colonists. Although wilderness, in American terms, exists in only a few isolated places in modern Europe, during the Middle Ages it was a significant and familiar component of the landscape. But it was less the physical familiarity with wild lands and more the place of wilderness in mythology and religion that shaped the common view of wilderness.

In the simplest sense, wilderness was the antonym of paradise. Whereas paradise was ordered, beneficent, and supportive of the human way, wilderness was foreboding, evil, and threatening. This image was communicated and reinforced through various media; both classical mythology and the folklore of various European tribes conveyed the idea of wilderness as a place beyond human control, a place of demons, monsters, and devils, of strange, grotesque beasts. Indeed, it is in the epic Anglo-Saxon story of Beowulf that we encounter use of the word "wildeor," a wild animal, which Nash identified as the etymological root of "wild-deor-ness," the place of wild beasts, and eventually the word wilderness.

Certainly the Biblical use of wilderness further reinforced such negative connotations. From the downfall of Adam and Eve and their banishment from the garden (paradise) to the 40-year wanderings of Moses and the Israelites in the Sinai Peninsula, wilderness described the setting to which individuals were exiled.

Yet, these early episodes also contain the first hint of a countervailing attitude toward wilderness. Added to the traditionally accepted dreadful image of wilderness was the idea that wilderness was a place where one could seek sanctuary from a fallen society, where one could find God, and where people could be purged and cleansed prior to finding the Promised Land. All these images conceived of wilderness not as a place of worth or merit itself, but rather as a means of achieving paradise. They represented the recognition of utility and value of wilderness, contrasted to the negative images typically associated with it.

As the European population grew and agriculture and industrialization spread, the wilderness landscape rapidly diminished. Although the rate of change varied throughout the area, it is generally agreed that the changes occurred sufficiently fast so that the forests of the region often did not reach equilibrium with the climate before they were destroyed or modified by human action (Poore and Gryn-Ambroes 1980). Conceptions and images of wilderness carried by early American colonists were strongly influenced by the religious dogma that dominated their culture. In many ways, the worst fears of these early settlers were realized when they first came in contact with the North American wilderness. The sheer immensity of it was beyond anything they could believe. The few remnants of wild land remaining in Europe were restricted to small, discrete pieces of country—a peak or a valley. In America, it stretched on endlessly. It was not only a physical barrier to movement, but it also harbored wild animals, Indians, and other threats. In a variety of ways, the American wilderness fit to perfection the belief, fabri-

cated over generations in Europe, of a place that harbored anti-Christian forces. Perhaps even more serious than its role as a barrier to progress or as a sanctuary for forces threatening to settlers was its capacity to lead man to succumb to the wildness of his surroundings (Grabner 1976). Unless constant vigil was maintained, the thin veneer of civilization could be lost, reducing man to a condition, as one early writer noted, "no better than carnivorous animals of a superior rank" (Nash 1982).

The early conception of wilderness in North America was dominated by fear and abhorrence. Period literature is full of references to wilderness as desolate, a howling wasteland, a godless tract. Although these accounts are derived from a relatively small segment of the society, they are typically the opinions of key community leaders, particularly spokesmen of the religious institutions. There seems little reason to believe that the North American wilderness held much for early settlers other than fear and foreboding.

But attitudes are not static. Attitudes are the product of a variety of influences and conditions and, as these change, attitudes change as well. As eastern seaboard settlement took root and westward expansion occurred, the image of wilderness evolved further.

## Shifting Attitudes Toward Wilderness

These tentative changes in attitude were not the forerunners of a major revolution in thinking about wilderness (Dearden and Sewell 1985). They do constitute a point at which ambivalence again began to emerge; wilderness was seen not only in its traditional role as a barrier to progress and a potential contaminant of the human spirit but also as a source of some more positive human value. What began to emerge as America grew was a view, albeit a minority perspective, that the wilderness landscape held value in and of itself, that it was not just the material from which civilization was to be fabricated. Nash (1982) noted that the concept of sublimity gained widespread usage in the 18th century. In the spirit of that age, the wilderness setting was considered pleasing, and emotional reactions to it were ones of awe and exultation rather than dread and loathing.

This tentative shift represents a critical point in our history; the symbolic representation of wilderness began to change. As Tuan (1974) has noted, the human capacity for symbolic behavior is great. For generations, wilderness was a symbolic manifestation of a great many things contrary to human welfare. As the 19th century began to unfold, we see, if not a rejection of this symbolism, at least a differentiation in it. This change raises questions as to what factors might have been responsible for such a reorientation. A review of this era's history suggests several possibilities.

First, this period marked a time of rapid growth in scientific understanding. Actually, beginning in the 11th century, the scientific sector of European culture had increased greatly (White 1967). With it came an increasing understanding of the world and evidence that natural phenomena such as mountains and storms were not the result of a vengeful God's wrath, but rather the end product of predictable physical laws and processes. Growth of

scientific understanding helped generate an appreciation of how nature in general, and wilderness in particular, revealed the glories of God; it contributed to a major shift from the traditional view in which such areas were seen as indicative of an absence of holy influence (Huth 1957).

Second, several authors have argued that the emergence of an appreciation for the vast wilderness of North America was the result of the search for a distinctive American culture (Lowenthal 1968; Nash 1982). Because the country's youthfulness largely precluded significant achievements in art or literature, America's cultural development was meager compared to that of Europe, and the lack of such accomplishments could not be fully offset by the new nation's flourishing economy or stable government. But ironically, the art and literature of the romanticists, much of it created by Europeans, helped generate an appreciative attitude regarding nature. Increasingly, Americans came to realize that a distinctive aspect of their culture was one not only absent from Europe, but one not even capable of being created there: vast, unfettered nature, represented in the wilderness of North America. Gradually a notion that appreciated certain values of wilderness began to take form.

A third factor was the gradual emergence of an urban population. At the onset of American settlement, pioneers confronted wilderness in a direct manner; there was no buffer to soften the impact, and survival was paramount. The lack of any deep affection for the raw natural surroundings against which they found themselves pitted was hardly surprising. But as distance between mainstream society and the wilderness frontier began to increase, so did the capacity for an appreciative stance, spurred by factors such as the rise of romanticism.

The beginning of westward expansion also marked the beginning of the diminution of what once was considered an endless tract of wilderness. The finiteness of wilderness and the fact that it could become scarce found its way into the American psyche, an important precondition to the recognition of wilderness as a public good (McCloskey 1966).

Although these changes in attitude did not constitute broad, pervasive shifts in public opinion, they were significant. They set the stage for a period during which recognition of wilderness values began to be supplemented by actions in the public policy arena.

The 1800's marked a significant turning point in America's relationship to wilderness. This shift turned on two fronts. First, there was continuing growth in the intellectual conceptualization of wilderness and its relationship to human society. Romanticism played a key role in this development; it viewed wilderness as sublime and a physical reality vital to society. As Nash (1982) noted, however, romanticism never seriously challenged the dominant pioneer attitudes toward wilderness; it merely provided momentary respite from the general antipathy toward such areas. Romanticism did not reject man's long-term dominating stance toward wild nature; it required only recognition of a broadened symbolic wilderness in which the beauty of such areas and their strengthening qualities to the human spirit were admitted.

Belief in a more fundamental function for wilderness relative to society contributed to a rise in the transenden-

talist view. Transcendentalism implied that a higher realm of spiritual truth paralleled the plane at which material reality existed and that it was possible, through intuition or imagination, for an individual to achieve this higher plane of consciousness. The more unfettered and uncontaminated the natural setting, the better it could facilitate spiritual insight and moral improvement.

Transcendentalism is well represented in the writings of Thoreau. Thoreau encapsulated this philosophical stance when he pronounced, in 1851, that "in Wildness is the preservation of the world." Wildness and its physical manifestation as wilderness, in the view of the transcendentalists, were essential to society's understanding of its relationship to God. In a reversal of earlier Puritan views, the inherent goodness of mankind could only be realized through the presence of wild nature.

Thus, the first major development in the 19th century that set the stage for a societal shift in attitude toward wilderness was the formulation of a philosophical framework within which such areas could be defined as contributing to human welfare. Although such a framework did not enjoy universal acceptance, it provided an alternative perspective that would serve as the basis for later, more profound alterations in America's view of preservation.

The second major activity in the 1800's involved the first calls for action to preserve wilderness. Twenty years prior to Thoreau's famous pronouncement, George Catlin, a lawyer, painter, and student of the American Indian, had introduced the concept of "a nation's Park, containing man and beast, in all the wildness and freshness of their nature's beauty" (cited in Nash 1982). Catlin's remarks were motivated both by his observation of the rapid disappearance of the wilderness as well as his concern with the contaminating influences of civilization on the wilderness.

Such pronouncements raised the issue of protection of wilderness values to a public, and therefore, political level. Calls for protection began to find realization in the second half of the 19th century. In 1864, the Federal government granted the State of California lands in Yosemite Valley for the purpose of preservation. In 1872, Yellowstone National Park was established as the world's first such reserve. It was followed in 1885 with creation of the Adirondack Forest Preserve by the State of New York, and in 1890, by Yosemite National Park, according to Nash (1982) the first park consciously designed to preserve wilderness.

Wilderness preservation was not the primary motivating factor for early protection. In the case of Yellowstone, designation was to prevent the area's "curiosities" from being taken up in private ownership while in the Adirondacks protection of valuable watersheds was the principal concern. Even in the case of Yosemite, the enabling legislation did not contain specific language citing wilderness preservation as an objective.

Much of this early action focused on the protection of areas with special qualities, such as the thermal features of Yellowstone, rather than on the protection of large tracts of undeveloped land that lacked any distinguishing values other than their naturalness. Even when protection was provided, support in the form of Congressional appropriations was often lacking. Without the intervention of the U.S. Cavalry, several National Parks, including

Yellowstone, Yosemite, and Sequoia, would have been exploited in the latter part of the 19th century (Hampton 1971).

Nonetheless, these actions provide evidence of a major revamping of social values, a shift of amazing proportions, because only a few decades earlier such actions likely would not have been even considered, let alone undertaken.

The ambivalence permeating evolving philosophical and religious thought over the years also was reflected in the policies of government. At the same time that precedent-setting actions of preservation were taking place, traditional views of progress and development were further codified through a variety of government policies and laws. These included the Pre-emption Act of 1841, the various Homestead Acts beginning in 1862, the General Mining Law of 1872, the Timber Culture Act of 1873, and the Desert Land Act of 1878. Such actions helped sustain not only the physical occupancy of the wilderness, but also reinforced the attitude that the Nation's duty was to subdue and develop remaining wild lands.

From roughly the last decade of the 19th century through the first two decades of the 20th century, a great transition occurred in America's attitude toward wilderness. Over this time, the negative evaluation of wilderness and support for its elimination were replaced by significant concern that at least some wilderness should be preserved.

This period of transition featured a gradual rethinking of the relationship between wilderness and society, characterized then, as well as now, by conflicting interests and competing values of the worth of wilderness. What was significant in this shift was the emerging view that the struggle between wilderness and civilization was not a matter of a conflict between good and evil but rather a debate over two goods, with resolution based on a judgment of the relative priorities associated with each.

The place of wilderness on the national agenda, in a historical sense, altered with amazing speed. What were the driving forces that underlay this shift? Why, in the 1850's, did Thoreau find little receptiveness for his views about the role of wilderness in civilization, yet in 1913, John Muir and Robert Underwood Johnson were able to elevate the Hetch Hetchy controversy into a major national issue, commanding the personal attention of the President?

## Wilderness in 20th-Century America

At least three merging phenomena of late 19th-century and early 20th-century America help explain much of our new view of wilderness. First, the seemingly unending wilderness against which significant struggle was required in order to establish European-style civilization was simply disappearing. With the 1890 Census, the frontier was officially declared gone and, with it, the environmental conditions that had spawned much of the unique American character. Moreover, there was no need to maintain the antagonistic relationship with wilderness; westernization had won. Second, the intellectual and emotional base for the support of wilderness from scientific, philosophical, and religious perspectives had undergone great change

during the latter 1800's. Increasingly, good reasons from a variety of perspectives could be offered in support of wilderness. Third, America was undergoing the growing pains of an emerging industrial civilization and many of the aspects of this new society were distressing. The slums, the squalor, the dehumanizing treatment of industrial workers all contributed to a rising concern that too much civilization, like too much wilderness, was not a good thing, and that as the distance from our wilderness origins increased, so did the need for continued contact with such settings.

With the momentous changes in the American landscape and society in the late 1800's, the period around the turn of the century was pivotal for wilderness support. Activity supporting the goals of preservation could be found in both the public and private sector. In 1892, for example, Muir, along with several professors from the University of California and Stanford, established the Sierra Club. It followed the precedent, established nearly 20 years earlier by the Appalachian Mountain Club, of uniting people with an interest in the out-of-doors. Although only one of several such organizations founded during this period, it clearly laid out its concern by mobilizing public support for governmental action to preserve the environment.

In 1916, the creation of the National Park Service represented a significant, long-term commitment by government to ensure protection of segments of primitive America and was an important consequence of the earlier steps taken to preserve Yellowstone and Yosemite. This action was in part due to growing public concerns with protection of natural values. In large part, however, it was a result of vigorous efforts by Stephen Mather to secure support for creation of the agency among key opinion leaders across the Nation. Between Mather and Robert Sterling Yard, over 1,000 magazine articles were published in support of the National Parks in 2 years and 275,000 copies of an illustrated book about the parks were distributed free to the Nation's opinion leaders (Fazio and Gilbert 1981).

Such a broad-scale shift in public and governmental attitudes was essential to any substantial growth in the wilderness idea. As Nash (1982) noted, possibly the significance of the Hetch Hetchy controversy is less the particular outcome of the debate than the fact that it occurred at all. Although conflicts remained and would continue, early 20th-century America had reached a point where the preservation of wilderness was increasingly viewed as important. From the 1920's until the present, the long-developing positive conception of wilderness in America gained broad public support.

The 60-year period between 1924 and the present can be broken into two subunits in terms of attitudes toward wilderness preservation. Between 1924 and 1964, there was an increasing maturation in the wilderness concept, expansion in public support, and growth in the role of government in wilderness preservation, and in its institutionalization as a land use. The period was initiated by the landmark reservation in 1924 of the 574,000-acre Gila Wilderness in New Mexico, largely through the efforts of Aldo Leopold. This action represented the first formal dedication of an area to wilderness purposes, setting the stage for creation of a system of land use reservations

that would match the National Park System in terms of its international precedence and significance.

The Gila Wilderness designation was followed shortly by a major inventory of remaining wilderness lands in the continental United States. The results confirmed that wilderness was diminishing. Such information provided support for creation of the first formal and systematic organizational program to achieve wilderness preservation goals—the L-20 program instituted by the Forest Service in 1929. Deeply imbedded reservations about wilderness remained, and it is interesting to note that the L-20 program created a system of “primitive areas” rather than wilderness areas, a step purposely taken because of concerns about public opposition to the establishment of wilderness. Ten years later, efforts by Bob Marshall, the dynamic and imaginative proponent of wilderness and then Director of Recreation for the Forest Service, led to a revised set of administrative procedures for the establishment and protection of a system of wilderness and wild areas on the National Forests. This new system was intended to gradually replace the earlier L-20 program and provide a more rigorous approach to wilderness preservation. Formerly permitted developmental activities were more tightly regulated and wilderness preservation purposes more clearly defined (Hendee and others 1978).

In approximately one decade, from institution of the L-20 regulation until the outbreak of World War II, over 14 million acres were set aside as wilderness on the National Forests. Additionally, the first explicit recognition of wilderness values was written into the enabling legislation for Everglades National Park. Clearly, the concept of wilderness had obtained a credibility sufficient to establish it as a legitimate value and land use. Rather than being an assumed or implicit quality, it now received recognition in and of itself.

However, the recurring theme of conflicting societal goals soon reasserted itself. Following the end of World War II, increasing demands, especially on the National Forests, for timber products soon brought the goals of a developing and expanding society into conflict with those of preservation. A similar kind of conflict, albeit different in form, occurred in the National Parks, as use levels and demands for services grew rapidly. Many felt that wilderness was considered only as a residual value and that when conflicts with traditional values and uses arose, wilderness would always lose. Moreover, the establishment of new wildernesses appeared viable only if it could be demonstrated that such areas did not involve the loss of any significant monetary values. Wilderness protection was a defensive activity, dependent on the good will and discretion of sympathetic administrators.

Concerns with the long-term protection of wilderness reached a peak in the mid-1950's with introduction of the initial bill to establish a National Wilderness Preservation System. In the ensuing 8 years, any doubts that wilderness had achieved broad recognition and support as a political issue were dispelled. Its tenacity was impressive; it reappeared with each Congressional session over 8 years, each time with more force. The wilderness issue and its supporters became intensely politicized. Literally thousands of pages of testimony were received, hearings were held nationwide, and Congress was flooded with

letters, resolutions, and petitions. Few, if any, items had ever received the level of public attention over such an extended period. Moreover, it was a time when wilderness advocacy groups acquired new levels of skill and expertise in dealing in the political arena, skills they would later use to even greater advantage. When the final wilderness bill was voted on, both Houses of Congress passed it with overwhelming majorities (see Allin 1982 for details of the Congressional debate over the Wilderness Act).

Passage of the Wilderness Act in 1964 constituted support for wilderness at the highest level of government and represented a transition to the second period in the recent history of wilderness. If one assumes that the actions of Congress reflect an estimation on that body's part of the interests and needs of American society, it is clear that an extraordinary shift in American attitude toward wilderness had occurred over a period of scarcely more than a century. The act represents an expression of nationwide support for the concept of wilderness as well as an expression of society's intent to back that attitude with action. As we shift attention to the second component of our recent historical review, the period from 1964 until the present, we will examine some indicators of this intention that reflect American attitudes and behavior with regard to wilderness.

At the time the Wilderness Act passed, more than 9 million acres were included in the National Wilderness Preservation System (NWPS). It was not clear how much wilderness might eventually be set aside, although Howard Zahniser, the Wilderness Society's principal architect of the act, estimated that perhaps 50 million acres might be included (Nash 1982). However, at the end of 1984, two decades after passage of the act, the NWPS had swollen to nearly 89 million acres, with the designation of many millions more pending. Over 60 separate pieces of legislation had worked through the elaborate and, at times, tortuous Congressional approval system to reach final passage. The NWPS has continued to grow, even though a wide spectrum of political ideologies have been represented in Congress as well as the White House. This virtual tenfold expansion in classified wilderness in 20 years is an impressive manifestation of the priority of wilderness on the national political agenda and its remarkable capacity to sustain itself in the minds of politicians and the public.

The political significance of wilderness has ensured that it remain a major concern for administrative agencies. For example, in less than one decade the Forest Service has undertaken two major reviews of the extent of roadless, undeveloped lands in the National Forest System, with the objective of recommending to Congress new additions to the NWPS. Both reviews (Roadless Area Review and Evaluation, RARE I and II) have been expensive, time-consuming efforts; public demands for information as well as high-quality performance in the conduct of these reviews have been considerable. During RARE I, for example, 300 public meetings were held nationwide, with over 25,000 persons in attendance. Public input included 54,000 individual and/or group opinions, and 18,000 signatures on petitions. During RARE II, 5 years later, over one-quarter million inputs were received, containing over 360,000 signatures.

Similar intense public interest has been witnessed for wilderness issues in the National Parks. The General Management Plan for Yosemite National Park, for example, where substantial wilderness values are found, generated tremendous public involvement. The National Park Service conducted 48 workshops nationally, drawing 5,600 participants. An elaborate workbook was devised in which various management alternatives were outlined, along with a section where citizens could devise their own management alternative. Over 700 possible choices were involved and the average time to complete the workbook was estimated between 4 and 8 hours; nonetheless, 21,000 of the 60,000 distributed were completed and returned (Buck n.d.).

## Summary

If we summarize the evolution of American attitudes toward wilderness over the past 250 years, several themes emerge. First, there has been a remarkable shift in those attitudes since the eastern seaboard was first settled by Europeans. Although the trend has not been even, the general tendency has been for a continually evolving conception that recognizes the importance of wilderness. The evolution has been driven by a variety of forces, including shifts of thinking among both scientists and philosophers, the increasing scarcity of wild land, and recognition of the value of retaining a diversity of environmental settings as a complement to an increasingly developed landscape.

Second, nature in general and wilderness in particular have commanded a central position on the political agenda. Wilderness has clearly achieved the status of a major public policy issue in America. While other issues will command attention from time to time, the importance of wilderness, especially its future stewardship, will remain a major concern.

Finally, the attitudes that society holds about wilderness, as well as those espoused by visitors to such areas, are critical to the planning and management of such areas. Therefore, science has a major responsibility to provide politicians, managers, and the citizenry with a comprehensive, accurate information base regarding these attitudes—their range, strength, and distribution—in order to facilitate the long-term preservation of wilderness.

Such attitudes include overall societal support for the concept of wilderness, factors influencing where to go as well as what to do while in wilderness, attitudes toward management, and the perception of other wilderness users. The next section examines factors affecting decisions about participation in wilderness recreation.

## REASONS FOR PARTICIPATION IN WILDERNESS RECREATION

The overall purpose of this review is to explore the factors that influence people's attitudes about wilderness and their subsequent behavior in such areas. We want to understand better the "why's" behind these attitudes and behaviors. In the previous section we examined general societal views of the **concept** of wilderness. Now we want to take a closer look at specific attitudes and behaviors as they relate to actual wilderness use. In this section, we ex-

amine the factors that lead people to visit wilderness and affect their decision to participate.

The reason for wanting to participate is generally considered the motive for behavior. This motive must be translated to behavior through some choice process, which can be influenced by many situational factors. The object of choice might be a particular recreation environment, a behavior, or some desired psychological condition. The selection of a particular wilderness environment depends on the attributes in the environment perceived as being suitable for fulfilling the needs that initially motivated behavior. These three components—the motives that initiate behavior, the choice process to determine the type of behavior, and the attributes of environment that affect the place selected for behavior—will be discussed below.

## Motives for Participation

**The Semantics of Motivation.**—Research on the topic of motivation in recreation has been filled with ambiguity. Different terms have been used to describe the forces initiating human behavior. We often say that people behave primarily to fulfill needs, and that a need represents a condition of human consciousness in which the individual perceives a relative deprivation in some aspect of existence. The concept of need is very plastic, ranging from universally shared needs, such as for food, to extremely individualized and contrived needs, such as for a video cassette recorder. Thus, the concept of need is a very broad way of representing forces that direct persons toward action with greater or lesser intensity.

A motive is considered to be a more or less consistent predisposition to act on a certain type or set of needs. The extent to which a given motive will direct behavior depends on the amount of perceived deprivation. Individuals can have a motive to experience nature that will direct them toward the selection of recreation activities in natural environments. This can result in an ongoing pattern of participation, but may have greater or lesser influence on any given decision.

Motives, like needs, are contrived notions. We can generate lists of motives for participation, and they might be more or less consistent over time. There is likely no universal list of motives, however, and the reasons for participation evolve as cultural and individual values evolve. Motives are a useful form of shorthand for representing the reasons why people engage in a certain type of behavior.

Reasons for engaging in recreation behavior have been conceived as "recreation experience preferences" (Driver 1976), in recognition of the fact that the forces that initiate behavior are voluntary and represent preferred conditions. If a certain need initiates behavior, we want that behavior to provide us with a payoff in terms of fulfilling that need. We walk into the wilderness because we have the desire to experience nature; thus, it is important that we do in fact experience nature. This payoff is seen as an outcome, and is why motives have also been referred to as "desired psychological outcomes" (Driver and Brown 1978) or "desired consequences" (Driver and Knopf 1977).

A particular behavior and environment are chosen in response to a given motivation primarily because the information available at that time leads us to expect that such

behavior and environment will, in fact, produce the desired outcome. Thus, we participate in recreation with some expectation that we will encounter desirable conditions. This is why motives have also been represented as "experience expectations" (Schreyer and Roggenbuck 1978).

Needs, motives, experience expectations, recreation experience preferences, and desired psychological outcomes all represent slightly different ways of looking at the purpose that engaging in a given type of recreation is supposed to serve (Crandall 1980). Measurement of the extent to which these outcomes are attained is usually represented as satisfaction. If the expected outcomes are not forthcoming, the person is assumed to be dissatisfied with the recreation experience.

The outcomes provided through participation in a given environment provide insights into the psychological function of that particular type of recreation for the individual and, consequently, help establish the value of a particular use of a given environment. The paper "Benefits of Wilderness Participation" (Driver and others this proceedings) focuses on these payoffs. In this paper we focus primarily on reasons for the initiation of participation, though the forces cannot be separated completely.

**Theoretical Approaches.**—Recreation research on motivation has drawn on existing models from the psychological literature. The most frequently used model has been expectancy theory (Lawler 1973), in which the force behind a given behavior is a function of the strength of expectancy that an outcome will result from a particular behavior in a given environment and the value of that outcome to the individual. One of the earliest users of expectancy models was Peterson (1974b), who explored the role of expectations and actually perceived conditions in the satisfactions of Boundary Waters Canoe Area recreationists. Roggenbuck (1975) used a similar approach to studying perceptions of whitewater river floaters in the backcountry of Dinosaur National Monument. Similar expectancy studies of whitewater floaters have been conducted in Desolation and Westwater Canyons in Utah (Schreyer and Nielson 1978) and on the Rio Grande River in Big Bend National Park (Graefe 1977). Rossman and Ulehla (1977) also explored the importance of wilderness environments for providing need-satisfying outcomes. Such studies underscored the significance of visitor expectations in influencing the wilderness experience, especially with regard to effects on the perception of objective conditions in the environment.

More recently, some researchers have attempted to use the more elaborate model of Fishbein and Ajzen (1975). This model includes a normative component in which behavioral intention is a function of the perceptions of significant others' expectations that a person should engage in a given behavior, and the individual's motivation to comply with the wishes of those other persons. This approach was used with limited success by Cockrell and McLaughlin (1979) to predict the environmental selections of whitewater river recreationists. While the complexity of the model has been a barrier to many researchers, the two areas of expectations and social norms have been major elements in research on understanding wilderness visitor attitudes and behavior.

**General Motives.**—Many studies have examined motives for participation in wilderness. Early studies were not geared toward a standardized measure of motive but asked visitors why they had chosen a given area. For instance, Bultena and Taves (1961) found Quetico Provincial Park visitors seeking opportunities to struggle with the elements, to get away from artificial settings, to explore, and to gain new experiences and personal gratification through realizing one's full capabilities. Most visitors were fishing, but the major rationale for visiting appeared to be not so much to catch fish as to be in a primitive and undisturbed area.

Lucas' classic study of Boundary Waters Canoe Area users (1964b) showed that people visited the area for reasons of solitude, to be with members of one's group, to learn about the area, and to commune with nature. Catton (1969) generalized about wilderness motives, particularly in terms of variations across different types of users. For instance, mountain climbers sought the opportunity to act in the face of uncertainty of success. In contrast, easy-access campers appeared to be seeking freedom from tension, from responsibility for the consequences of one's actions, and from parental duties. Catton noted that the desire for social interaction was often a strong motivator for participation, but so was privacy. Finally, Catton suggested that wilderness is valued for the "intellectual puzzles" that nature presents, which is why more highly educated people might be attracted to wilderness.

Although it would be possible to generate long lists of motives from numerous studies, it seems more useful to pursue generalizable consistencies in observations. One motive traditionally associated with wilderness use is solitude. While solitude is a part of the wilderness concept as defined by Congress, research indicates that the concept is not simple to interpret. Persons seeking solitude may likely be in the presence of others but seeking seclusion, anonymity (Twight and others 1981), or shared intimacy (Lee 1977). Hammitt (1982) found four dimensions to the concept of solitude in wilderness: natural environment, cognitive freedom, intimacy, and individualism. In a related effort, Hammitt and Brown (1984) found five dimensions related to the pursuit of privacy in wilderness: emotional release, personal autonomy, reflective thought, personal distance, and intimacy. It appears that what is generally described as solitude really covers a number of motives.

While people value sharing the wilderness experience with others, this is not a reason for wilderness participation as such. The social dimension is something that goes across the range of recreation participation and is not unique to the wilderness experience. Research on wilderness motives tends to show that although social reasons are often cited, they are generally less important than other motives (Shafer and Mietz 1969; Rossman and Ulehla 1977; Feingold 1979; Brown and Haas 1980). Similarly, although the escape motive is strong in wilderness participation, escapism is also a motive for other outdoor recreation activities (Driver and Knopf 1976).

Another dimension reported regularly in studies on wilderness is one that would appear to be obvious: appreciation of the natural environment. Beyond the nature experience and the pursuit of solitude, few other dimensions

of motivation appear to be shared as consistently across studies (Kaplan and Talbot 1983).

While we seek common reasons for wilderness participation, we are aware there is considerable diversity in the reasons held by visitors. We next review the factors underlying these differences. First, we examine motivations linked to the type of activity pursued; people can have very different reasons for pursuing different types of activities, even though they all take place in a wilderness setting. Next, we examine differences across patterns of participation. We then look at the influence of the individual's background characteristics on motivation for participation. There are also potential combinations of motives for participation and these are also reviewed. Finally, we will look at how visitors to different wilderness settings vary in their motives.

**Activity-Centered Motives.**—The activity most strongly linked to wilderness participation is hiking. Lucas (1971) suggested that esthetic values—the enjoyment of scenery and contact with nature—were the most important motives for participation, exceeding exercise, socializing, or specific activities. He also noted that the esthetic response was more emotional or romantic than intellectual or educational. Temporary escape was seen to be a major theme.

Studies on hikers carried out in the East (Bowley 1979; Knopf 1983) and West (Brown and Haas 1980; Haas and others 1980b) tend to reflect similar results. Wellman and others (1982) identified significant differences in the rated importance by hikers of certain motives in Shenandoah National Park and park managers' predictions of those motives. The importance of motives to meet and observe new people, to learn and experience nature, to enjoy scenery, to reflect on personal values, and to express creativity is often underestimated. Thus, it might not be enough to observe that a motive is present. Rather, it is important to note the relative intensity of that motive (Brown and Haas 1980).

Bultena and Klessig (1969) provided a conceptual overview of the satisfactions derived from camping. They claimed that motives pointed toward benefits that could be derived specifically from the resource, rather than from mere change of pace or setting. They also argued that camping emphasizes the primitive, an "activistic" orientation, the search for a personal experience, and intrinsic rather than status-oriented goals. In a study oriented specifically toward the motives of campers, Hollender (1977) found important factors to be "primitive lifestyle," escape from responsibilities, esthetics of the natural environment, and escape from urban stress.

Motives for fishing have been explored in wildland settings (Driver and Cooksey 1977). Studies typically reveal that psychological motives are more important than the specific product pursued; that is, anglers seek the opportunity to relax, achieve, and socialize more than they value the fish (Knopf and others 1973; Kennedy and Brown 1976; Hendee and others 1977; Manfredo and others 1978; Knopf 1983).

Studies of hunters echo similar themes. More (1973) showed that hunters value the display of equipment, the desire to be outdoors, shared experiences with companions, escape, and challenge. Display of game and the enjoyment of eating it were also important. Other studies

have shown the importance of escape, exercise, and companionship, and the lesser importance of actually harvesting game (Hautaluoma and Brown 1978; Hautaluoma and others 1982).

More specialized activities, such as cross-country skiing (Haas and others 1980a) and mountain climbing (Ewert 1984), have also been examined. Perhaps the most widely studied specialized activity is whitewater river floating. Roggenbuck (1975) and Schreyer and others (1976) found that the most important factors for floaters in Dinosaur National Monument were action/excitement, learning about nature, stress release/solitude, and affiliation. Similar results were found on the Rio Grande River in Big Bend National Park by Graefe (1977) and Ditton and others (1981), and in Desolation and Westwater Canyons in Utah by Schreyer and Nielson (1978). The motive studies on rivers invariably show outcomes similar to terrestrial situations, with the addition of motives related to action and excitement reflecting the whitewater component.

Finally, some studies have attempted to compare motives across different types of users of the same environment. Bassett and others (1972) compared the motives of trout fishermen and canoeists. In perhaps the most elaborate comparison of different types of users, Brown (1981) compared motives among backpackers, hikers, campers, fishermen, hunters, river runners, and cross-country skiers. He showed that motives common to all were relationships with nature, escape from social pressures, and being with one's recreation group.

In summary, although there are differences across activities in terms of specific motives or the relative intensity with which motives are held, there is nonetheless considerable agreement among visitors about the reasons for wilderness participation.

**Patterns of Participation and Motivation.**—It is likely persons with different motives pursue wilderness recreation in different ways. Roggenbuck (1975) and Schreyer and others (1976) compared persons floating the Green and Yampa Rivers through Dinosaur National Monument who exhibited different trip characteristics: day to overnight users, paddle trips to oar-powered trips, and commercial to private and educational trips. In each case, significant differences in motivation were noted.

Similarly, Ditton (1979) compared the motives of local to nonlocal floaters on the Buffalo National River and found significant differences in virtually all cases. Hammitt and Loy (1982) compared winter to summer visitors to the backcountry of Great Smoky Mountains National Park. They found winter visitors sought to avoid summer crowds and experience the winter environment.

**Background Characteristics and Motivation.**—Differences in motivation resulting in different patterns of participation in the same activity can be seen as the result of variation in background characteristics of the individual. For instance, Driver and Knopf (1976) linked differences in intensity of motivation to personality attributes.

A person's attitude toward the environment is another source of variation in motivation. Schreyer and others (1981) asked visitors to the backcountry of Canyonlands National Park whether they came because they liked the park itself, or because it was a good place to do their

favorite activity. Significant differences were found between the two types of visitors in their motives for participation: those who liked the park itself were more interested in general learning and less interested in social recognition, testing one's skills, stimulation, being with friends, or tension release, than those who visited the park to pursue their favorite activity.

One background characteristic that has been explored in some detail is the amount of previous experience an individual has had in the activity. This variable has been used primarily with respect to whitewater river floaters; however, other types of wilderness participation have been similarly studied. McCool and Haydock (1976) examined differences in motives of hikers of the Virgin River Narrows in Zion National Park, based on differences in amount of experience. They found that experienced users tend to value escape more, and are less strong in their desire for action or excitement.

Differences in motive intensity related to previous experience have been shown in river settings by Roggenbuck (1975) and Schreyer and others (1976) in Dinosaur National Monument, in Desolation and Westwater Canyons in Utah (Schreyer and Nielson 1978), and on the Buffalo National River (Ditton 1981). In addition to intensity of motive, Schreyer (1982) showed there were differences in the specificity with which river runners stated their reasons for participation. Experienced users tended to be more detailed and specific in stating their expectations.

Previous experience can be defined in different ways. Schreyer and Lime (1984) showed that differences in motivation depended on whether experience was measured on the particular river being floated or experience in river running in general. To characterize the nature of this complexity, Schreyer and others (1984) created a six-category measure of "experience use history" to represent previous participation on the study river, on rivers in general, and the total number of different rivers run. Persons in the different categories showed different motive profiles for engaging in the activity.

**Clusters of Motives.**—Many motives influence the decision to participate in wilderness recreation. They vary considerably in relative intensity. To deal with this complexity more efficiently, researchers have attempted to classify people by shared groups of motives. Bowley (1979) distinguished two types of users based on differences in motives for affiliation, arousal, escape, and self-awareness. Using a clustering routine, Haas (1979) identified five "experience types" among hikers in three Colorado wilderness areas. Manfredo (1979) used a similar approach to identify three different experience types in wilderness areas in Wyoming. The fact that these studies identified different numbers of types illustrates the complexity in variation of motivation. Although people can share similarities in motivation, it is unlikely that specific, discrete "types" of wilderness recreationists can be defined.

**Setting Types.**—We assume that recreationists select different settings in which to pursue wilderness recreation because different motives for participation require different types of environments to fulfill perceived needs (Driver and Brown 1978). Thus, if one were to study different wilderness environments, variation in the relative importance of different motives for participation would be expected.

Haas (1979) compared types of backpackers, as mentioned above, across the Weminuche, Rawah, and Eagles Nest Wildernesses in Colorado. Having created five experience types for each area (a total of 15), he found that 10 of the types were unique to the various areas, while two were common across all areas and another was common across two areas. In contrast, Brown (1981) compared the motives of hikers, fishermen, and wilderness backpackers in the East and the West. While some differences emerged, the participants were more alike than different in motive profiles.

Williams and Schreyer (1981) compared the motives of visitors to the High Uintas Wilderness in Utah to those of visitors to the backcountry of Canyonlands National Park, also in Utah. The former area is characterized by alpine settings, while the latter is desert/canyon topography. Visitors to the desert placed more importance on tension release, competence testing, escape, and family togetherness than their counterparts in the mountains.

In river settings, Schreyer and Nielson (1978) compared the motives of floaters in Desolation Canyon on the Green River and Westwater Canyon on the Colorado River, both in Utah. While studies show statistically significant differences in the motives of recreationists in different settings, there is some question as to how big those differences really are. Knopf and others (1983) compared the motives of floaters on 11 different rivers across the Nation. They concluded that while differences across the rivers were noted, the motive profiles were more similar than they were different.

In summary, a variety of motives underlie wilderness recreation participation. Many of these motives are linked to opportunities typically associated with wilderness, such as the desire for escape and solitude, appreciation of esthetics and naturalness, and challenge and risk taking. Others, however, are less integrally associated with wilderness: meeting and observing others, making new friends, and various status-related motives are important for many visitors. Although typically less prominent than the former, these latter motives help improve our understanding of the "why" of wilderness participation.

Research also suggests that our conceptions of motives may often be oversimplified, particularly when we try to translate them directly into guidelines for management. Solitude is an excellent example; frequently cited as a measure of intergroup contact, it is in fact a complex construct that involves a variety of measures people use to regulate access to themselves (Altman 1975). Depending on its specific conceptualization, definition of the relevant measure and its implications for wilderness management will vary greatly. It seems likely that other motives share similar complexity and that our present conceptions of them are bound by limitations inherent to our measurement instruments.

Multiple motives underlie most participation. A behavior is engaged in to satisfy a number of wants. Variations in the specific motives identified will vary by individual, place, and activity. Over the population, however, the collective package of motives identified in research is most striking in terms of its similarity rather than its difference. The relative ranking assigned specific motives varies, but the constituent motives remain relatively consistent.

What does appear to vary is the intensity and specificity with which motives are identified. Factors such as previous wilderness experience probably help shape more rigorous conceptions of motives as well as produce greater intensity of support for them.

Finally, the motives identified by wilderness participants are often those identified by other types of recreationists. Our ability to distinguish recreationists by motives is limited. It may prove more useful to focus efforts on identifying variations in the intensity with which motives are held and the specificity with which they are defined, perhaps along with clearer articulation of the clusters of motives identified by different wilderness user groups, than in attempting to identify wilderness-specific motives that predict participation.

## Decision Making and Participation

Given a certain set of motives, an individual must decide what type of behavior is most likely to fulfill his or her needs. The person can choose recreation, wilderness participation, and a particular environment and set of activities. To understand the forces leading to certain types of behavior and demands for wilderness opportunities, it is necessary to understand the factors influencing the decision process.

**Decision Theories.**—Early models of choice behavior tended to focus on information processing. Knopf and Driver (1972) and Driver and Brown (1975) adopted a problem-solving approach to recreation choice behavior. Individuals were seen as examining alternatives that would most rationally result in fulfillment of their needs. Thus, a high correspondence between the environment chosen and the need state of the individual was expected.

Haas (1979) examined multiattribute choice models from the consumer choice literature, but ultimately used the expectancy-valence model (Lawler 1973) to examine wilderness preferences. A comprehensive examination of recreationists' decision making has been performed by Krumpe and McLaughlin (1982). They reviewed the literature on choice models, including compensatory models, noncompensatory models, and elimination-by-aspects models, then suggested that recreation choice behavior could be best represented as a constraint-driven, conditional, sequential, elimination-by-attributes model (also see Stankey and McCool 1985).

The model proposed is untested, though McLaughlin and others (1982) did present information that floaters on different river segments vary in their perceptions of the desired attributes of the rivers. Applications of theories of choice have been incomplete. For instance, Cockrell and McLaughlin (1979) were not able to predict choice of a recreation environment using a test of the Fishbein and Ajzen approach (1975). Although not testing the entire Fishbein/Ajzen model, Manfredo (1979) did provide support for a link between basic attitude orientations of wilderness users and their support for various managerial actions. Harris (1982) suggested that different hikers might actually use different decision-making algorithms.

**Factors Influencing Decisions.**—Many of the factors influencing the decision to participate in wilderness recreation have little to do with wilderness as such. The avail-

ability of time, money, or access are all barriers. Many of Krumpe and McLaughlin's (1982) constraining attributes are situational concerns; they assert these will influence the decision to participate before the more positive attributes of an environment will affect choice. One major factor constraining decisions is likely to be the amount of information available to the individual making the choice (Stynes 1982).

Indirectly, data on background characteristics and use patterns of users support these contentions. For instance, wilderness users are predominantly from regions close to the wilderness and a large proportion of use is not for long periods of time (Stankey 1971a; Hendee and others 1978). Thus, constraints of time and distance could serve as barriers to participation.

Social influences exert considerable pressure on the individual. Thus, a person may be influenced by family or friends in the choice of an environment in which to recreate. Knopp and Leatherberry (1982) suggested that collective decision making can influence the information available to an individual choosing to participate. However, Cockrell and McLaughlin (1982) suggested that those most likely to be influenced by social forces are inexperienced participants.

The most common type of group is families, comprising half of all participants, while formal organization members vary from 2 to 10 percent (Hendee and others 1978). Schreyer and Nielson (1978) found that the most common reason river runners gave for going on the trip was that others were already going. Further, allegiance to a group for recreation purposes can be strong. When Schreyer and Downing (1980) asked backcountry visitors to Canyonlands National Park how often they recreated with the persons they were currently with, 46 percent said "frequently."

One factor that can influence the desire to participate is the classification of wilderness itself. Some people have expressed concern that when areas are formally designated as wilderness, they become more visible to the public and are perceived as more desirable as a recreation destination. Becker (1981b) provided indirect support that designations such as Wild or Scenic River increased the perceived desirability of the environment. However, McCool (1985) presented evidence that formal designation of Montana's Rattlesnake Wilderness did little to change participation in the area.

We see participation in wilderness recreation largely as the simple, straightforward desire of people to be in a wilderness. Nevertheless, people might end up in a wilderness because their friends are going, because the area is nearby and easily accessible, or because they simply are not aware of alternative environments in which to recreate.

## Attributes and Participation

The previous section concluded that people visit different wilderness environments to fulfill different needs. This suggests that attributes of the environment are important in the decision to participate; they can facilitate or hinder the fulfillment of these needs. Given that such behavior might serve to guide development of an inventory for classifying different recreation environments (Buist and

Hoots 1982), a growing amount of research has examined the attributes of wilderness environments seen as desirable by recreationists.

One earlier attempt to assess attributes important to the wilderness experience was carried out by Peterson (1974b). He had Boundary Waters Canoe Area visitors rate 90 attributes on the desirability of their presence. Undesirable overperformers (things more common than desired) tended to be most commonly identified.

McDonough (1982) found that characteristics of recreation places were important in people's decisions to participate, but that the types of attributes that were important changed with the type of activity. Thus, it was not possible to standardize the aspects of recreation places found important. McLaughlin and others (1982) identified differences in environmental characteristics for six distinct river segments in the Flathead River complex in Montana. They concluded that the segments, though related geographically and used for the same activity (river running), had varying characteristics sought by recreationists for different experiences.

McLaughlin and Paradise (1980) compared the physical, social, and managerial attribute preferences of Idaho cross-country skiers and snowmobilers. They attempted to look at the desired experiences of the users, and concluded that some attributes may be more activity dependent than experience dependent.

The previously discussed motive typology studies have taken user groups and compared them using sets of attributes (Allen 1979). Manfredo (1979) compared his three motive types on 17 groups of attributes and found differences across the types on seven of them. In a somewhat different approach, Haas (1979) used discriminant analysis to see how attributes might predict experience types. He found five resource-attribute-discriminant functions, though the ability of the functions to discriminate among his five experience types was only on the order of 16 to 28 percent.

As an alternative approach to these methods, Watson (1984) employed a microcomputer selection strategy that had people rate desired preferences and then select areas based on the presence of the desired attributes. He wanted to see if a sequential decision process might be modeled through the computer program. Results indicated that in fact there was little correspondence between respondent ratings of attributes for wilderness environments and their subsequent selection of those environments. It is possible that people give more weight to certain attributes in making a decision than they do when rating their desirability individually.

Another approach used by Beaulieu and Schreyer (1982) provided respondents with an open-ended listing of desired attributes, rather than a set list. They compared visitors to mountain and desert wilderness environments, as well as those with differing amounts of experience. Attributes were classed into 16 different categories and ultimately reduced to four—physical, social-psychological, managerial, and activity. Significant differences were noted in the type of attribute and the mix of attributes named by respondents (Beaulieu 1983). Further, a comparison of onsite visitors with persons contacted at home and asked to make a hypothetical decision for participation also showed

significant differences in the attributes identified (Beaulieu and Schreyer 1985).

Attribute research has consistently shown differences in preferences across activity, environment, and desired experience. However, there is no standardized list of attributes related to participation. Each study remains an idiosyncratic listing of setting features. Future research needs to be able to identify those attributes most consistently related to the behavior of wilderness recreationists.

## Summary

What motivates a person to visit wilderness? Obviously there are many reasons, and they tend to vary among individuals as well as within individuals over time. A person visiting wilderness likely is there for a variety of reasons, many of which might have little to do with the fact that the area is indeed a wilderness.

Motives for visiting wilderness have been measured in many different ways throughout the years, though there has been an increasing movement toward more rigor and generalizability in both measurement and analysis. Motives initiate action; they form the basis for decisions to engage in certain behaviors. As a result, we engage in those behaviors expecting to attain the outcomes that originally motivated them. These expectations form a frame of reference against which we gauge our satisfaction with the experience. They might be more important in determining our enjoyment than actual objective features of the environment.

The most commonly cited reasons for participation in wilderness are solitude and to experience nature. Other reasons commonly mentioned are escape and social experience. It should be noted that none of these reasons is exclusively dependent on a wilderness to be realized. Rather, people perceive wilderness as a good place to attain these outcomes. Specific motives such as escape and social experience do not induce people to visit wilderness as such. They more often tend to come as a consequence of the overall experience.

While many motives are shared, others are not. Further, the relative importance of motives can vary considerably. Variations are a function of the type of activity people engage in, their patterns of participation (length of trip, mode of transportation), the environments they are in, and the background characteristics of the individuals themselves, such as the amount of previous recreation experience they have had. Many other ancillary factors, such as social group influences, proximity to a wilderness, and the formal designation of the area as wilderness, can affect the actual decision to participate.

Recent research has recognized the complexity inherent in motivation by attempting multivariate analyses of visitors' motives. This has resulted in the creation of "types" of wilderness visitors based on combinations of motives. However, these types have generally been idiosyncratic to specific studies.

There has also been an increasing effort to link various motives to preferences for specific attributes in the wilderness environment. This line of research is of growing practical significance in the planning and inventory of oppor-

tunities for different types of desired experiences. Again, this research is in an early stage, and the results of studies often have been difficult to interpret or generalize. However, the complexity inherent in motivation and in preference for various settings represents a challenge that can direct future research.

## FACTORS AFFECTING VISITOR BEHAVIOR

Once a person has decided to visit wilderness, many kinds of behavior can be exhibited and many types of experiences obtained. This section is devoted to understanding factors affecting visitors while in wilderness. The first part will examine the psychological response of the individual to the environment and attempt to characterize the nature of the wilderness experience, as well as visitor perceptions of those environments. We then look at factors influencing patterns of participation in wilderness.

### The Wilderness Experience

In the last section we talked of attributes of environments as they related to the desire to participate. The individual, however, is not a passive reactor to elements of the environment. Because people bring images and expectations with them, there is the tendency to filter attributes through mental conceptions of wilderness. To understand wilderness behavior, we must be able to view wilderness through the eyes of the visitor (Knopf 1983).

The way a person perceives the environment involves a subjective experience influenced by a collection of individual factors such as cultural and social forces, need state, and life history. Given the complexity of all the factors involved, we can never really know another person's experience; the best we can do is to express, through language, what appear to be shared perceptions.

Such expressions are particularly tentative when referring to environments that contain many symbolic elements of human emotion and values, such as wilderness. Even so, people talk of the wilderness experience as though it were a tangible and widely shared concept. What then constitutes that experience?

The wilderness experience represents a feeling ostensibly unique to wilderness. Essentially, we perceive relatively natural environments, then add cultural and personal meaning (Schreyer 1981).

The values of wilderness have been described in the popular literature by advocates of the concept. Although not empirically based, they represent shared meanings of the purpose of wilderness. Empirical support does exist for these values in more recent literature on motives and psychological outcomes.

Common themes in many popular writings emphasize "nature appreciation, education, freedom, solitude, simplicity, as well as spiritual, esthetic, and mystical dimensions of the wilderness experience" (Hendee and others 1978). Many of the early wilderness advocates echoed particular themes. John Muir wrote heavily of spiritual values (Wolfe 1938), while Robert Marshall characterized esthetic qualities (Marshall 1930). Aldo Leopold supported wilderness

as a place to maintain unique recreational opportunities (Leopold 1925), while Sigurd Olson described the wilderness experience as one of insight and personal peace (Olson 1956). Arthur Carhart saw wilderness as a place for mental and moral restoration (Carhart 1955). Wallace Stegner claimed that the wilderness experience helped define our personal consciousness by serving as a frame of reference for our daily lives (ORRRC 1962). Many times, there is no clear distinction between what constitutes a wilderness experience and the values derived from experiencing wilderness.

Tuan (1974) maintained that the wilderness experience derives its meaning strongly from the urban experience: "Attitudes toward wilderness...insofar as they are verbalized and known, are sophisticated responses to environment that have their origins in the city. They presuppose the existence and recognition of environmental types and a degree of freedom to choose among them" (p. 248). Kaplan and Talbot (1983) maintained that, while much work has been done on various values associated with wilderness, there has been little research concerning what constitutes the fundamental and distinguishing nature of the wilderness experience. On the other hand, Frissell and Stankey (1972) assumed it would be possible to define a "pristine wilderness experience," a construct including "encountering no other people on a visit, the opportunity to witness completely undisturbed ecosystems, and so forth."

Scott (1974), in reviewing the works of a number of authors, claimed that a sense of "enhanced perception" was a common theme. Similarly, Hammitt (1982) maintained that a major aspect of the wilderness experience is that it affords a particular state of attention in which the individual is not required to attend to elements not considered to be a primary part of the experience. This is facilitated through the concept of "solitude" or "privacy" (Hammitt and Brown 1984); social expectations for interaction may be one of the strongest forces for distraction.

It is likely there is no such thing as the wilderness experience in terms of objective criteria. Knopf (1983) pointed out the many ways in which people can experience the same environment depending on their frame of reference. A given campsite can be seen as being either too secluded or too crowded depending on the expectations of the visitor (Foster and Jackson 1979). If visitors are seeking different types of experiences, they will likely feel differently about what they encounter.

Further, perception of the environment can be affected by the extent of differentiation a person makes. Some might see one wilderness as similar to another, while others obtain different feelings in different life zones or drainages in the same wilderness. How does the formal designation of wilderness affect the type of experience a person is likely to gain there? Would the same state of mind exist if the area were merely an unclassified roadless area (Schreyer 1980; Knopf 1983)? Reed (1973) showed that people's affective responses to hypothetical environments differed depending on whether they were labeled "National Park," "National Forest," or "State Park."

A major influence on perception is previous experience. A person might feel more affiliation with an environment through previous experience (Tuan 1974; Williams 1980),

and evaluate the environment through many more subjective and symbolic values. Visitors to a new environment might evaluate what they encounter as normal (Heberlein 1977), while those who are experienced will evaluate the same scene in the context of what they have experienced before (Schreyer and others 1976; Nielsen and others 1977).

Images that people possess of an environment, whether experienced personally or not, will affect their behavior and perceptions in the environment (Knopf 1983). Such images often have little to do with objective reality (Hunt 1975). Rather, they are subject to shaping through marketing or through cultural myths and values (Lee 1972; Schreyer and Roggenbuck 1980). It is apparent that the experience of wilderness is likely to be highly personalized. Thus, much of the discussion of wilderness focuses on the individual's subjective state.

## Wilderness Experience as Subjective State

**Characterizing Subjectivity.**—In essence, the wilderness experience can be characterized as whatever we are experiencing when we feel we are in wilderness; as such, it is not subject to objective measurement. Further, Knopf (1983) suggested that the way in which we conceptualize such environments is colored by our disciplinary backgrounds (for example, psychology, sociology, or resource management).

This need not constrain us from understanding the nature of things experienced. Given there is no absolute definition, it becomes a challenge to characterize the dimensions or features people use to describe what they feel.

Roderick Nash has been a consistent proponent of the fact that wilderness is "all in your mind" (1982). This emphasis has, in fact, been a strong underpinning to the notion that one does not have to visit wilderness to experience it. "Knowledge value" of wilderness suggests the experience goes beyond the bounds of the legally defined area.

This subjective meaning of wilderness is tied not just to the environment itself, but also to the context within which we define it. According to Tuan (1974, p. 112): "By the time we can speak of preserving and protecting wilderness, it has already lost much of its meaning. . . .

'Wilderness' is now a symbol of the orderly processes of nature. As a state of mind, true wilderness exists only in the great sprawling cities."

A wilderness experience depends on the person's perception of an environment. Thus, researchers have increasingly involved cognitive psychology to describe responses to environments. Kaplan (1977) described two basic types of attention, voluntary and involuntary. Many of the attractions of natural environments appear to be those that focus strongly on involuntary attention, capturing the attention of the individual with little effort or notice (Driver and Greene 1977). Attractions that fascinate or arouse us involuntarily fall into this category.

Voluntary attention, on the other hand, is much more active. This can be demanding and result in a need to return to a more casual and passive involuntary state.

Hammitt (1982) claimed that wilderness solitude represents pursuit of a state of involuntary attention. However, a key is that the person controls the conditions under which that involuntary attention is exercised; one does not have to worry about the necessity to respond to a series of unrelated demands, such as social pressure. Hammitt (1984) maintained that this ability to attend to what one wants reduces the "cognitive cost" to humans, performing a restorative function for the individual. In research on the perceived values of wilderness environments, he reported that two elements seen as being particularly important were "resting the mind from anxiety and mental fatigue," and "promoting a sense of tranquility and peacefulness."

Subjective experiences are also characterized by emotion or effect. Many descriptions of wilderness experiences are characterized by altered states of mind in which strong emotions are felt. For instance, Scott (1974) described an "illusion" experienced by George Catlin through concentrating on a map of North America, in which he saw himself floating over the continent and witnessing the destruction of the bison. The emotional impact of this experience resulted in his vision of creating National Parks. According to Scott, "The episode can be described as a self-induced altered state of consciousness characterized by depersonalization, hallucinations, altered time sense, an intense feeling state, oceanic yet simultaneously detailed perception of environmental wholeness, intuitive intellectual insight, and a resultant prophetic proposal."

Thus, the wilderness experience has cognitive and affective components that interact to produce the experience. Ulrich (1983) developed a model of the relationship of effect to perception. He asserted that a person's initial effective state will influence the perception of the natural environment, and that the effective reaction to that environment will affect cognition or interpretation of what is seen, degree of sensory arousal, and future behavior. In some cases, this effect can serve to intensify and enhance the experience for the individual, and can be translated into action. According to Ulrich, "A wilderness backpacker who is fatigued might feel exhilaration or elation upon viewing an aesthetically spectacular setting, and these effects would produce physiological arousal and help to sustain his journey" (Ulrich 1983, p. 94).

Such states of restoration, effect, and arousal appear to help the individual attain higher states of awareness or self-consciousness (Scott 1974; Young and Crandall 1984) and improve the likelihood of attaining Maslow's (1968) level of "self-actualization," in which the person achieves a sense of personal fulfillment at the maximum level of human performance. The process of self-actualization is often characterized by "peak experiences," defined as situations in which the individual becomes egoless, where space and time become relatively insignificant, and the person's identity becomes merged with action and attainment of a greater sense of the whole environment.

Scott (1974) claimed that the most prominent wilderness writers, such as Muir, Catlin, Thoreau, and Leopold, used terminology closely linked to these concepts. He suggested that wilderness environments catalyzed their personal self-actualization. In making the argument that such environments promoted self-actualization, he cautioned against assuming that **only** such environments or experiences did

so. Rather, he was claiming, much like Hammitt (1984), that such environments were particularly rich in characteristics that foster such states. The wilderness experience can promote altered states of consciousness and awareness, but it shares this quality with other forms of human experience, such as art and religion.

In perhaps the only empirical test of such relationships, Young and Crandall (1984) concluded that wilderness users were more self-actualized than nonusers. Frequent wilderness users, however, were no more self-actualized than nonfrequent users, and the strength of the relationship between wilderness use and self-actualization was concluded to be weak.

**The Religious/Spiritual Experience.**—When focus moves toward altered states of consciousness and extreme conditions of effect, wilderness experiences appear similar to mystical, spiritual, or religious types of experiences. This is strongly rooted in the philosophical writing about nature by early wilderness advocates, and the linking of nature with the transcendental experience by writers such as Thoreau.

John Muir considered “wild nature” the conductor of divinity, and believed that wilderness should exist as a source of free-flowing psychic and spiritual energy (Nash 1982). Arthur Carhart (1920, p. 20) felt that “the individual with any soul cannot live long in the presence of towering mountains or sweeping plains without getting a little of the high moral standards of nature infused into his being.” Joseph Wood Krutch (1958, p. 275) stated, “Wilderness and the idea of wilderness is one of the permanent homes of the human spirit.” Roggenbuck and others (1973) used the philosophy of Sigurd Olson to express the long-term notion of spiritual impact of the wilderness experience:

They think they go into the back country for a lark, just to test themselves or to face a challenge, but what they really go for is to experience the spiritual values of wilderness. . . . It may take years for them to realize what they found, but sooner or later it will come back to them. . . . (Olson 1969, p. 137)

Much of the writing moves from the concept of the experience of wilderness itself to suggestions that the natural environment should be used as a source of inspiration for the development of human ethics (Churchill 1982; Douglas 1983). This belief has led to study of different religious or value systems such as Native American cultures (Callicott 1982; Erickson 1977), or Asian religions, such as Taoism (Ip 1983), Jainism, Buddhism, and Hinduism (Nash 1982), that are compatible with respect for nature. Tuan (1974) warned that any culture’s stated ethos does not necessarily represent their actual behaviors toward the environment; many cultures espousing unified views of humans and nature nevertheless have participated in major environmental depredations.

Although most writings have been in the domain of the philosophical, there have been some attempts to take a more systematic look at the spiritual aspects of the wilderness experience. Scott (1974) used a framework of altered states of consciousness designed by Fischer (1971) to analyze the nature of the experience being described by the nature writers. Using this framework, Scott noted:

. . . the reverie of Catlin is a meditative state mediated by the parasympathetic component of the autonomic nervous system and the treetop adventure of Muir would be an ecstatic state resulting from stimulation of the sympathetic division of this system. Carl Jung . . . conceptualized self-development or “process of individuation” in much the same way as Maslow and used the term “archetype” to describe man’s inherited unconscious complex of feelings, ideas and images. Jung personally received tremendous inspiration from nature and mountains and perceived in the latter an expression of man’s potential. Wilderness experiences may involve the expression and reaffirmation of specific archetypes. (Scott 1974, p. 236)

Spirituality can encompass a broad range of human experiences. Some of this spirituality has been viewed in the context of a religious experience. Perhaps the most detailed analysis of the religious content in wilderness is Graber’s monograph (1976). This work is more speculative than empirical, but it attempts to bridge the gap between religious and wilderness values. She noted that religious experience does not have “content,” but rather is characterized by the subjective nature of human feelings toward certain objects, institutions, or ideas. Wilderness is essentially “sacred space,” an environment toward which religious feelings are directed. Graber used the notion of “geopiety” to represent a broader feeling of “reverence, propitiation, affection and compassion” (Graber 1976, p. 5) directed toward the earth. In this sense, many religious feelings directed toward wilderness are really manifestations of broader ethical feelings about one’s relationships with nature, in much the same way that a specific church is the vehicle for experiencing one’s feelings about Christianity.

Graber drew analogies between wilderness purists and religious sects. Both represent a social order in which there is an accepted rhetoric and mode of behavior to reinforce the validity of the belief system. The imagery and content of the revered writers serve to direct one’s perceptions in wilderness, so that one is attuned to seeing the “right” things, and thus becomes appropriately socialized to being able to have the religious experience of wilderness.

Graber asserted that religious connotations are hard to escape, even when segregated from one’s personal religious feelings:

The wilderness ethic is strongly religious in character. Wilderness is treated as sacred space by the community of purists, whether or not purists consciously accept the notion of wilderness as hierophany. (Edward) Abbey considers himself an atheist, Krutch was an agnostic, at one time (Ansel) Adams denied or apologized for the spiritual quality of his photographs; yet none of these artists can quite escape his own preoccupation with sacred power. If one believes that wilderness is a manifestation of sacred power . . . he gains a fixed point, or center, which stands out from the chaotic relativity of ordinary life. (Graber 1976, p. 11)

Graber argued that wilderness provides a source for religious experience because it is a focal point for human needs for order, for community, and for a unified image that can provide meaning. She asserted that the force of this feeling is catalyzed into political action by those affected. Much of this energy "stems from the ability of wilderness imagery to flow into the void left by the erosion of spiritual and aesthetic values associated with the countryside and city" (Graber 1976, p. 115). Whatever the mobilizing forces, it is apparent that because people perceive wilderness as an appropriate focus for the expression of religious feeling, this becomes part of a broader litany through which persons may learn to experience values that religions traditionally deliver: meaning, order, transcendence, communion.

## Perceptions of Environments

Much of the previous section has dealt with the effective content of the wilderness experience. This section will focus more on the cognitive elements of wilderness: what people actually perceive as the object of the wilderness experience, and how that is given meaning in the mind. This will influence the set of attitudes people hold about wilderness.

**Wilderness Purism.**—It is virtually impossible to tap the full range of personal meanings of wilderness. Because it is subjective, many idiosyncratic components of knowledge and feeling will be involved. However, it may be possible to create some summary that may reflect these broad concepts. This has led to the attempt to develop attitude scales tapping people's concepts of wilderness.

The first effort to represent empirically the range of wilderness visitor attitudes was made in the Pacific Northwest by Hendee and others (1968). They created a set of 60 questions consisting of 20 items on liked or disliked features of wilderness, 20 on activities that might occur in wilderness, and 20 on benefits that might be obtained. Respondents were to rate the items on a scale from "strongly dislike" to "strongly favor." Persons who were at the purist end of the scale in terms of more extreme scores were labeled "wildernists," while those at the other end were labeled "urbanists" (Hendee and others 1968).

Responses to the scale were factor analyzed to explore the underlying dimensions of wilderness attitude. Of course, the selection of items in part predetermined the content and nature of the dimensions. They identified seven different dimensions of wilderness attitude: spartanism—the physical desire to encounter the environment in a challenging manner, antiartificialism—the appreciation of the lack of signs of human development or activity, primevalism—the desire to experience a natural setting, humility, outdoorsmanship, aversion to social interaction, and escapism. Using the degree of association of items in the factors as a guide, a refined scale was then developed using only 30 of the items. This refined scale was subsequently used to compare wilderness users' perceptions toward appropriate behaviors and toward possible management strategies, and their background characteristics. They found wilderness purists to be young, highly educated, and predominantly from urban back-

grounds, lending support to the notion that wilderness appreciation arises from an urban culture.

This concept of tapping the wilderness-attitude domain has been criticized as having somewhat questionable validity. There is the feeling that what is being measured is limited to the domain of the 30 items, which may be a very narrow expression of people's attitudes toward the wilderness experience (Copp 1967). Heberlein (1973) noted that any attempt to measure attitudes should recognize both the effect and belief components of attitudes. Further, there is a need to understand that attitudes are linked and interwoven in a complex manner. One must be able to account for the centrality of the attitude toward the object being studied and the relationship among the attitudes. Heberlein asserted that failure to consider these factors in the conceptualization of such an attitude scale limits the practical utility of its application.

Stankey (1971b) used a somewhat different approach to the measurement of wilderness attitude. He attempted to link the scale to the Wilderness Act with the rationale that because that legislation served as a constraint on, as well as a guide to, management of wilderness, attitudes should be defined in the context of the act. His scale consisted of 10 statements concerning three aspects of wilderness defined in the act: ecology, level of development, and simplicity of recreational activities. Four other items relating to the nature of the wilderness environment were also added. Respondents rated each item in terms of favorability on a five-point scale ranging from very desirable to very undesirable.

Persons were scored according to their answers ranging from 14 to a possible 70 points. Persons at the high end of the scale were labeled "strong purists" while those at the other end were "nonpurists." Stankey used this classification to examine differences in user perceptions of encounters with others (Stankey 1973). He argued that because purists were closest to the conception of wilderness held in the legislation governing these lands, managerial decisions about limiting use and protecting the environment should be geared toward the attitudes of persons who were closest to the spirit and intent of the legislation (Stankey 1972).

Wilderness purism scales have not achieved widespread utilization. Applications of the results from such scales might be hindered by the notion of "purist," which carries with it elitist connotations that run counter to more democratic notions of management. Schreyer and others (1976) developed a wildernism scale based on Stankey's approach. They developed an initial scale of 27 items and then used 17 to classify river floaters in Dinosaur National Monument. In order to avoid the potential semantic contamination of the purist label, persons scoring high on the scale were called "high wildernists." Differences in wildernism scores were linked to significant differences in visitor characteristics, motives for the trip, trip characteristics, perceptions of crowding, and evaluations of management strategies.

Rentz and Schreyer (1977) developed a multi-item "attitudes toward wilderness" construct in a study of wilderness hazard perception. They found that although the scale was positively related to previous exposure to general information about hazards, it was not related to

perceptions of hazards independently. In a similar study, Williams and others (1984) found that prowilderness attitudes did relate to greater preparation and awareness of hazards among cross-country skiers.

**Wilderness Attitudes and Perceptions.**—Although it is difficult to tap the full domain of attitudes toward wilderness, it is much easier to identify specific attitudes and perceptions. One approach has been to ask people what elements characterize wilderness. A public opinion survey to test general public awareness of wilderness (Yankelovich, Skelly, and White, Inc. 1978) asked people what activities they felt were or were not permitted in wilderness. They did not define wilderness or make reference to legally designated areas, leaving that to the interpretation of the respondent.

Over half the public believed developed campgrounds with sanitary facilities were permitted, 42 percent believed sightseeing by car was permitted, 41 percent thought commercial harvesting of trees was permitted, and 32 percent thought motorcycling and jeeping were permitted. Although people might be disturbingly unclear about the exact properties of wilderness, it is notable that they have strong positive feelings for the concept. Eighty-three percent of the sample believed that the Federal Government has an obligation to save large areas of undeveloped land for wilderness preservation.

In an attempt to assess visitor perceptions of wilderness qualities, Schreyer and Nielson (1978) asked river floaters in Desolation and Westwater Canyons in Utah if they felt they had been in a wilderness while on the trip. Eighty percent of the sample indicated in the affirmative. Respondents were then asked when they felt the wilderness began (neither river is formally designated in wilderness status). For Desolation Canyon, nearly a third indicated it started while riding to the launch site, while another 15 percent indicated it started at the launch site.

Another approach has been to ask persons to describe what characterizes a particular environment for them. In a public opinion poll about attitudes toward the California Desert (not legal wilderness), the Field Research Corporation (1977) found that 62 percent of the respondents indicated beauty and nature, 54 percent said solitude, 42 percent identified freedom, and 34 percent said adventure. Beaulieu (1984) used an open-ended format to ask people for aspects of a wilderness environment that led to their desire to participate there. The largest proportion of respondents identified aspects of the psychological experience as most important. About 45 percent of respondents identified these elements, while only about a quarter of the respondents identified actual physical components of the environment.

Lucas (1964b) asked visitors to the Quetico-Superior area of Ontario and Minnesota about their perceptions of wilderness qualities, the area considered wilderness, and appropriate uses. Although there were substantial variations in response, most visitors had well-defined notions of what constitutes wilderness. Approximately three-fourths of the canoeists sampled identified wilderness qualities as a major reason for visiting the area (Lucas 1964a).

In assessing preferences of the public for wilderness conditions, Peterson and Lime (1973) cautioned against potential measurement bias. They provided evidence that

nonresponse bias can affect the validity of data, and suggested that persons answering questions in the field might answer differently from persons answering at home. Beaulieu and Schreyer (1985), in a study of wilderness attribute preferences of persons onsite versus those at home, also found significant differences in response patterns.

One of the major components in the perception of wilderness qualities is the more general idea of the esthetics of natural environments. There is a vast literature on this subject that has been organized and reviewed elsewhere (Daniel and Vining 1983; Ulrich 1983). Worth noting, however, is an increasing tendency to move from evaluations of general landscape features to specific components of the environment, such as air quality (Daniel 1979) and the impact of sound on the experience (Kariel 1980; Anderson and others 1982). An important aspect of esthetic qualities is the extent to which they can be used to establish the value of a particular area. In this regard, Leopold (1969) used esthetic elements to characterize Hell's Canyon on the Snake River as a unique environment.

**Perception and Satisfaction.**—How do people evaluate wilderness? What makes them satisfied or dissatisfied with what they encounter? Because wilderness is a resource judged by subjective criteria, sources of satisfaction and dissatisfaction provide insights into what comprises the most appropriate definition of wilderness. Sources of dissatisfaction can provide managers with feedback indicating the extent to which they are providing desired wilderness conditions.

While it makes sense to measure satisfaction, research efforts to do so have not been highly successful. Global measures of satisfaction are often used, but these provide little in the way of useful information about a person's response to the many varied and complex aspects of the recreation environment (Probst and Lime 1982). Thus, there has been an increasing tendency to measure various aspects of satisfaction. For instance, Ditton (1979) used nine different statements related to satisfaction in surveying Buffalo River floaters.

Studies have looked at specific elements contributing to overall satisfaction, such as mode of travel (Shelby 1980a). Lucas (1980) looked at the degree of association between a number of elements of the trip and overall satisfaction for wilderness hikers, while Shelby and Nielsen (1975) did the same for river floaters. Peterson (1974b) used a similar though more detailed approach to evaluating sources of wilderness quality through the discrepancy between desired and actually encountered conditions. Other approaches to the subject have included measuring changes in the behavior of users in response to perceived conditions (Anderson 1980).

Because motives represent reasons why people visit wilderness, it stands to reason they would be related to satisfaction with conditions encountered. The importance of the motive is thus critical; if high, then we would anticipate a close correlation between the extent to which that motive is satisfied and the actual use conditions that foster its realization. If the motive, say solitude, is of low value, however, there might be little dissatisfaction with high levels of encounters (Stankey and McCool 1984).

McCool and Petersen (1982) linked types of sources of satisfaction and dissatisfaction to respondents' scores on various desired psychological outcomes. They argued, following Herzberg's (1976) two-factor theory of satisfaction, that separate conditions might produce satisfaction and dissatisfaction and that a condition whose presence leads to satisfaction might not result in dissatisfaction when absent; conversely, conditions producing dissatisfaction do not necessarily lead to satisfaction if absent.

One of the most important concerns addressed by this research is what factors are most important in contributing to visitor dissatisfaction. One of the most important sources of dissatisfaction—encounters with others—will be dealt with subsequently. Many other sources of dissatisfaction in wilderness are related to perceptions of impacts resulting from human use (Bultena and others 1981a). Studies generally focus on different dimensions of impacts. For instance, Lucas (1979) examined various environmental factors in three wilderness environments. Litter turned out to be the most commonly perceived negative impact.

McCool and Petersen's (1982) work on the two-factor notion found that some aspects of the environment served to act as satisfiers, enhancing the experience, while others were seen as dissatisfiers, detracting from the experience. The most commonly perceived dissatisfiers were related to encountering others. Other negative factors were litter (identified by 57 percent of respondents), insects (47 percent), and dogs (35 percent).

Some studies have looked at specific negative aspects. In a study of dispersed forest recreationists, Downing and Clark (1979) showed that 92 percent of managers felt litter was a serious problem, compared to 50 percent of visitors, though both identified it as their most commonly perceived problem. Ninety-one percent of managers felt vandalism was a serious problem, compared to only 37 percent of the visitors.

In a river setting, Shelby and Nielsen (1975) found that perceptions of use-related impacts correlated significantly with overall trip satisfaction on the Colorado River in the Grand Canyon. In a less pristine setting on the Upper Delaware River in New York, Dawson and others (1981, 1982) also found litter to be the most commonly perceived problem, though only 23 percent of their respondents listed it as a serious problem. In a study of Boundary Waters Canoe Area Wilderness canoeists, Anderson (1980) examined "negatively valued attributes" perceived at entry points and campsites as well as during the day one entered the wilderness. Seeing litter, having to camp at heavily used campsites, and seeing peeled bark on trees were among the most negative of perceived attributes.

As part of the National River Recreation Study, recreationists were asked to evaluate a comprehensive list of perceived problems (Knopf 1982). The most common problem was again litter, with 54 percent of all respondents across 38 different rivers indicating that it was at least a slight problem.

One concern about impact is the extent to which it might be changing. Lucas (1980) asked repeat visitors to nine wilderness areas whether conditions were getting better, worse, or were about the same. While roughly half the respondents indicated things were about the same, the proportion of persons who identified conditions as getting worse ranged from 20 to 37 percent.

Evaluations of impact can vary depending on the nature of the individual. For instance, Vaske and others (1980) showed that persons who had first visited an environment several years before tended to evaluate environmental conditions more negatively than those whose first visit occurred recently. Anderson (1980) showed differences in evaluations of impact across the four motive-profile types she created for the Boundary Waters.

Two major observations emerge from this research. First, visitor dissatisfaction may result as much from differences in individuals as it does from differences in the objective conditions in the environment. Variations in motivations and previous experience are significant influences on evaluations.

Second, the most commonly cited sources of dissatisfaction have to do with the presence of others or their perceived impacts. Litter is probably the single greatest negative factor encountered in a wilderness setting.

## **Influence of Information on Participation Patterns**

To this point, we have examined factors that influence visitor attitudes, perceptions, and behaviors. Although many of these factors are inherent in the individual or the environment, others are a function of management. Managers often desire to influence visitor behaviors or perceptions, in order to maintain the quality of the environment or reduce problems causing visitor dissatisfaction.

One of the more common techniques for influencing visitor behavior is using information to aid visitors' decisions about such things as trails to hike or campsites to use. This can have a positive effect on the persons involved because they are more likely to find a place meeting their expectations. Further, it can serve as a management tool in helping to distribute use away from heavily impacted areas.

The distribution of information has been tied to other management strategies, such as the requirement for permits (Lime and Buchman 1974). Such permits can be a source of information that can be fed back to the visitor about use patterns and rates. Further, issuing a permit can serve as a source of contact with agency personnel, and an opportunity to give visitors information that might help disperse use (Magill 1974).

A growing body of research has developed from attempts to influence visitor behavior through the use of information. Although some successes have been noted, results are mixed, suggesting more sophisticated methods may be necessary. The primary focus of information research has been on redistributing use from heavily used sites to less impacted areas.

**Use Distribution.**—Schomaker (1975) found that information on "crowded areas" in Colorado's Rawah Wilderness handed out at the trailhead had no significant effect on travel route selection. A similar attempt to redistribute use through rules printed on required permits in the Great Gulf Wilderness of New Hampshire (Canon and others 1979) also failed to obtain significant results. Lucas (1981) attempted to redistribute use in the Selway-Bitterroot Wilderness through the use of brochures providing information on use levels of trails. Overall use patterns were not shifted toward lightly used trails. Such results have

been blamed on information being given to visitors after the decision to use an area had already been made, suggesting that such information needs to be available earlier in the decision process.

In the Boundary Waters Canoe Area, persons with permits for heavily used entry points in 1974 were sent information packets before the 1975 season, providing information on use levels and alternative routes. Results showed about one-third of the respondents claimed the information influenced their travel plans for 1975 (Lime and Lucas 1977). Krumpe (1979) and Krumpe and Brown (1982) employed an experimental design in Yellowstone National Park to influence trail selection by providing persons with information about characteristics of various trails based on visitors' desired experiences. They found that 37 percent of the subjects selected one of the targeted trails. Hahn (1982) used a photographic decision-tree approach with visitors to the San Rafael Swell region of Utah before they made actual travel plans. She found that about a quarter of those who returned to the Swell actually used new areas targeted in the process.

Increasingly, research has attempted to do more than just give information to recreationists. One approach is to test the relative effect of different media for communication. Roggenbuck and Berrier (1981, 1982) tested the value of two different information media to distribute camping use in North Carolina's Shining Rock Wilderness. They used a brochure alone and in combination with a personal message. Both approaches resulted in redistribution of use, but neither was more effective than the other.

**Appropriate Behaviors.**—In addition to distributing use, information can affect the behavior of wilderness visitors. Because impact is a particular concern, development of behaviors likely to minimize impacts is a desirable goal. This can depend on previous learning on the part of the individual, or it may be a function of conscious efforts to give such information to visitors in a way likely to produce the desired behavior.

Fazio (1979a) suggested that a mandatory permit is a successful way to deliver information to wilderness visitors. There is the question as to which type of communication is most effective. In a test of backcountry hikers in Rocky Mountain National Park, Fazio and Gilbert (1974) used a brochure, slide show, and trailhead sign to inform hikers of appropriate behaviors. Only the slide show resulted in significant improvement in low-impact camping knowledge.

Different media can be more or less useful in getting to the visitor. In a study of Selway-Bitterroot visitors, Fazio (1979b) reported that the most commonly reported sources of information concerning appropriate behaviors were the Forest Service, "experience," and friends and relatives. McCool and Haydock (1976) found that the most common sources of information on safety behavior among Zion Narrows hikers were park rangers and warning signs.

Although it might be possible to identify sources of information, it is not clear just how effective they are. In a study of cross-country skiers in the Wasatch Mountains of Utah, Williams and others (1984) found that only 48 percent of skiers reported ever seeking out any information on avalanche hazards, and only 17 percent had sought out

information on the day of their outing. Rentz and Schreyer (1977) underscored the importance of previous learning in showing that there was an **inverse** relationship between exposure to park information and preparation for natural hazards in Arches and Canyonlands National Parks.

To maximize effectiveness, some have attempted multimedia approaches. For instance, Matheny (1979) reported an attempt to reduce trail shortcutting through the use of signing, local school poster contests, and the use of mass media. The program, combined with experimental revegetation, was considered a success.

In recognition of the need to become more sophisticated in reaching audiences, researchers have adopted notions of "market segmentation." This approach is geared toward identifying persons most likely to be a source of concern, studying their characteristics, and then targeting information strategies directly toward them. For instance, Matheny (1979) identified 13- to 17-year-olds as the group most likely to engage in shortcutting. Consequently, special school education programs were targeted toward them. Robertson (1982) found several factors significantly related to appropriate behavior in wilderness, including knowledge of behaviors, attitude, education, and age. Fazio (1979b) reported on studies of the knowledge of wilderness users in Rocky Mountain National Park and the Selway-Bitterroot Wilderness. He found cross-country hikers and technical climbers to be more knowledgeable than day hikers in Rocky Mountain National Park. In the Selway-Bitterroot he found outfitters and group leaders to be more knowledgeable than hunters, day users, pilots, or horse campers. Thus, if one wants to be effective in reaching people, it might be useful to attempt to reach persons with the least amount of knowledge.

## Role of Education in Influencing Behavior

Information can be seen as a passive way of influencing behavior, while education is a more active approach. There is a belief that education will not only create a greater appreciation of wilderness, but will increase demand for such environments (Hendee and Roggenbuck 1984). A more common notion of wilderness education is the use of a field experience in which the individual confronts the forces of nature. Such programs, often described as "high adventure" or Outward Bound types of experiences, are deemed to have long-term beneficial effects on the individual, not only in terms of appreciation of the wilderness environment, but in the self-concept that has benefited from challenging nature.

Many studies have been performed on these types of programs, and the literature has been summarized elsewhere (Meier and others 1980; Kaplan and Talbot 1983; Kaplan 1984). Although much attention has been directed to this topic, results are not particularly straightforward. A number of studies describe both immediate and long-term changes in participants (Thorstenson and Heaps 1973; Heaps and Thorstenson 1974; Kaplan 1974; Thorstenson and others 1975). Other studies are less positive. Gillette (1979), in a study of attitude changes

resulting from participation in an Outward Bound program, found significant changes in only 15 percent of the items measured. In a test of potential changes in anxiety levels of participants in both an adventure program and in a leadership experience, Chesnutt (1982) found neither long- nor short-term changes.

It appears that approaches to this line of research will have to be more standardized and systematic to establish generalizable conclusions concerning the effects of such programs. Programs differ significantly in clientele, course content, duration, and intensity. Measures vary from attitudes to personality dimensions to actual behaviors. In this sense, it is often difficult to know who is doing what to whom.

## Social Influences on Behavior

Any attempt to understand the nature of human behavior in a wilderness setting must account for social influences on behavior. Because most visitors enter wilderness in groups (Cheek and others 1976; Lee 1977), the wilderness visitor is enmeshed in a social context that strongly defines the recreation experience (Cheek and Burch 1976; Knopf 1983).

Social groups have been identified as a major influence on recreation participation (Field and O'Leary 1973; Field and Cheek 1974; Hammitt and McDonald 1982). Such social considerations might be more important in predicting behavior than the activity, as that behavior might be keyed to the group dynamics of the situation (O'Leary and others 1974; Field 1976). Participation can be the result of the desirability of social interaction itself. Social learning can affect people's preferences for participation, as evidenced by the influence of activities learned as a child on adult preferences (Yoesting and Burkhead 1973). Hendee and others (1968) found that nearly 70 percent of wilderness users made their first visit to a wilderness before the age of 15. Further, indirect factors such as stage in the family life cycle can affect preferences for different types of activities. For instance, Burch (1966) found that remote-camping families were most likely to be those just starting a family or older families in which the children were leaving home.

Many social forces are at work to influence an individual. Cockrell and McLaughlin (1982) outlined ways in which social influences operate on wild river recreationists. They suggested that such forces shape beliefs about the desirability of various activities, the motives for participation, and through direct social influence on participation. Social group influences can be an important force in shaping members' behaviors (Sessoms and Stevenson 1981). Further, the mechanics of the group composition, such as party size (Lime 1972), can affect behavior patterns.

As a part of a specific cultural group or lifestyle, individuals identify certain activities or behaviors as being appropriate to demonstrate that lifestyle. Thus, rates of visitation to National Parks are generally higher among middle class communities than working class communities (Bultena and Field 1978, 1980). In many cases, recreational activities are seen as defining the lifestyle, and unique "social worlds" can evolve (Devall 1976).

Persons acting in a group have a notion of appropriate behavior within the group. Such social roles might be specific to a given situation. However, Burch (1965) suggested that activities carried out in forest settings show considerable overlap to roles played out in daily life. To the extent that people feel certain behaviors are appropriate, they are responding to shared norms of the group.

Such norms might be global perspectives on how lands such as wilderness should be managed or used. In their study of wilderness users in the Pacific Northwest, Hendee and others (1968) identified five clusters of norms about appropriate behaviors shared by visitors: responsibility and equity, rejection of controls on behavior, withdrawal from the symbols of civilization, maintenance of unpolluted campsites, and camping skills. This survey was conducted at the beginning of the environmental movement; given that use pressures and controls have shifted dramatically since, it would be interesting to see whether a replication would yield the same dimensions of norms.

In his study of wilderness "purism," Stankey (1971b) used measures of visitors' attitudes on levels and types of use of the wilderness, as well as preferences for management alternatives. These values became the rhetoric of purism. Graber (1976) asserted that "wilderness purists" have a definite "ethic" of behaviors that should be exhibited. In a sense, this defines membership in the class of purists. One identifies oneself not just by one's attitudes, but by one's behaviors.

Social forces can affect the meaning of a given place, determining the behaviors judged appropriate within the environment. Lee (1972) suggested that a major factor influencing behaviors in remote settings is the image of the place shared by social groups and their conceptions of appropriate behaviors keyed to that definition. Schreyer and Roggenbuck (1980) suggested that shared meanings of places can be global and affect specific behaviors only in a very general sense. In support of this notion, Schreyer and White (1979) showed that park visitors' definitions of the meaning and purpose of National Parks were unrelated to their evaluations of the appropriateness of certain nontraditional recreation activities. Rather, evaluations were more linked to an individual's participation in the activity; if he or she participated in the activity, he or she was more likely to consider it appropriate.

Social forces can also affect a person's perception of the experience itself. It is possible that group sentiments reinforce individual evaluations of satisfaction, in a sort of "aren't we having a good time!" fashion. Lime (1977) suggested that persons with considerable experience, such as commercial outfitters on whitewater float trips, can exert considerable influence over the experience for visitors. Influence can range from enhancing visitor perception through interpretation to increasing visitor arousal by creating illusions (for example, that rapids are larger and more dangerous than they really are).

## Evolution in Behavior

The forces influencing wilderness behavior are dynamic. As a result, the notions of what constitutes appropriate behaviors also evolve. Some of this evolution is in response to use pressure. For instance, the norm in rock

climbing has moved to "clean" climbing rather than traditional methods such as the use of pitons and other more permanently defacing techniques. Technology has had an impact as well. Lightweight, portable cooking sources are not only common, but in many cases required. The traditional wilderness experience of cutting pine branches for one's bed and sitting around a large campfire in the evening has been replaced with minimum-impact camping techniques. Even where such behaviors are not required by agency personnel, they can become part of a norm used to assess the legitimacy of an individual's presence in wilderness.

The evolution of technologies has led to controversy over the extent to which certain activities are appropriate. For example, are hang-gliders appropriate in wilderness? It can be argued that few activities are closer to representing harmony between user and environment. Does the technology involved represent the trappings of civilization any more than a lightweight backpack or tent? Is the visual intrusion any more offensive than the sound and contrails of a 747 passing overhead? Such questions force us to confront both the perceptual and legal conceptions of what really represents wilderness; continual evolution of technologies is likely to continue, particularly if there is a market supporting research and product development (White and others 1980).

There has also been an evolution in the nature of experiences sought in wilderness. A growing number of persons are using such environments to actively seek risk (Schreyer and others 1978). Wilderness environments can be very challenging, and persons seeking to experience risk find them attractive for such encounters. Many reasons have been advanced for why people seek to put themselves at risk. They range from stress-seeking personalities (Klausner 1968) to physiological chemistry of the brain (Zuckerman and others 1972) to neurotic death wishes. Schreyer and White (1979) suggested that risk involves a situation in which a person gains immediate feedback about performance and is required to behave in a way that requires optimal use of skills and abilities. This leads to feelings of self-determination, achievement, and a sense of perceptual focusing on the activity, resulting in a greater sense of awareness and heightened personal insight.

## Summary

Wilderness is an objective reality composed of physical objects in the environment. What makes those objects "wilderness," however, depends on our personal feeling about such environments. In this sense, it is a very subjective concept. Our image of wilderness is likely influenced by our values, beliefs, emotions, previous experiences, exposure to information, social influences, and even our fantasies. These subjective images affect what we consider wilderness, whether we decide to visit it, and what we experience when we are actually there.

Public perception of wilderness is very positive when the general population has been surveyed. There is tremendous variation, however, in what people actually consider wilderness to be. People also vary strongly in their intensity of feelings toward the value of wilderness. This range

of intensity has been measured by various researchers as "wilderness purism" or "wildernism." Such value systems have been linked to attitudes toward wilderness preservation, management, and appropriate behaviors while in wilderness.

The frame of reference people carry into the wilderness affects their perception of and experience in wilderness. While anyone can have some kind of experience in environments labeled as wilderness, much research has focused on "the wilderness experience" itself. This wilderness experience does appear to be tangible and valid, but it is very idiosyncratic, and depends on individual needs and images. There is more to it, however, than just saying "people are different." There are, in fact, commonalities underlying the idiosyncrasy. This is because the elements of perception involved are generalizable to other aspects of human experience, especially extreme states of consciousness.

One point of commonality is that persons tend to describe the wilderness experience in terms of enhanced states of perception or awareness. Another element is the tendency to describe such experiences in mystical, spiritual, or religious terms. Persons who have studied these experiences find that the subjective feelings described are very similar to those found in studies of the religious experience in general.

It is helpful to think of wilderness as serving as a catalyst for persons seeking a state of altered consciousness. In this sense, the wilderness does not "give" the person the wilderness experience, so much as it serves as a vehicle for such perceptions. This is a function of setting conditions in which such perceptual focusing is possible, a set of beliefs within the person that such states are desirable (people generally do not have either wilderness experiences or religious experiences if they do not consider them desirable, although people may attain such states without consciously aspiring to them), and a belief that such settings are likely to produce such experiences. In the same sense, a church does not give a person a religious experience; rather, it is seen as a place in which such an experience appropriately occurs. Also, as in a church, social reinforcement may help a person attain such experiences.

It is important to emphasize that such experiences are tangible and perceived as real. Further, the outcomes of such experiences in wilderness are essentially the same as those of a religious experience: a sense of meaning, order, transcendence, and communion.

What makes a person satisfied with what is encountered in the wilderness setting? This is a complex topic, as satisfaction is a multidimensional concept. Many elements go into a determination of satisfaction. However, research has consistently shown that the two most commonly cited sources of dissatisfaction are the presence of others and evidence of human impacts, especially litter. The evaluation of the presence of others is variable across settings and persons. The presence of litter, however, is among those most consistently recognized negative impacts across the range of research examined.

Many factors affect people's perceptions of wilderness and their behavior while in the environment. Some of these are amount and type of previous experience, infor-

mation previously exposed to, background characteristics, social group forces, one's emotional state, and the environment itself. People are not static entities, and their behavior patterns can change over time. Such changes can be a function of evolution in technology or in the conditions in the environment, through changes in the person's life cycle, and changes in the types of experiences sought, such as the growing desire to experience challenge and risk.

There is an increasing tendency to study what influences visitor behavior, with the intent to affect behavior for management considerations. For instance, social group forces have been shown to be very important in influencing norms of appropriate behavior. If such forces could be tapped, they would be very powerful vehicles for behavioral compliance.

The area of behavioral influence that has been most studied is the use of information. Attempts have been made to use information to encourage visitors to stay away from more heavily used areas and to adopt appropriate behaviors, such as minimum-impact practices or taking precautions against natural hazards. The results of such studies have been mixed, suggesting there might be more to influencing human behavior than just giving people information. These considerations should form the basis for future research efforts. Indirect means of managing people in wilderness are of growing importance.

Questions of appropriate behaviors and administrative response to calls for different types of opportunities suggest that the notion of wilderness management is challenging. One of the other papers in this collection deals specifically with the notion of wilderness management (Brown and others this proceedings). We recognize that an important input into decisions about what management strategies to use is the attitudes of visitors toward those management strategies and it is to this topic we next turn.

## ATTITUDES TOWARD WILDERNESS MANAGEMENT

Many studies have been conducted on the attitudes of wilderness visitors toward various management actions. In some situations these actions have been planned; in others they have already been implemented and visitors are responding to their presence. The studies cover a period of over two decades, and there have been some major shifts in opinion about management as there have been in attitudes toward wilderness in this country.

One of the most important sets of attitudes visitors possess deals with the management of wilderness.

Managers seek information on visitor attitudes toward management actions for a variety of reasons. Will visitors support a change in management or do they support the current program? How strongly do they feel about some proposed action? Which segments of the public are supportive of some action and which are opposed? All of these are legitimate issues that managers might seek input on from attitude studies. Data on visitor attitudes, however, need to be put in the context of the other factors that influence decisions.

We need to stress that attitudes are not a prescription for management. Laws and policies might often dictate certain actions that are not popular. In these cases, managers can use attitude information to help reveal potential dissatisfaction, thereby alerting them to the need for programs that explain the rationale for such actions. Such efforts might not change the opinions people have concerning the action but could increase their knowledge and lessen the chance of conflict.

In other cases, people's attitudes are based on poor or incomplete information about the management action and fail to account for consequences that might be detrimental to wilderness values. To follow such attitudes irrespective of these outcomes would be irresponsible. At the same time, a knowledge of these attitudes would be helpful in designing programs that upgrade visitor understanding.

Because attitudes predict behavior only partially, managers need to be careful about placing excessive reliance on attitudes as a guide for management. Even where strong opinion about some matter is registered, it is still possible that visitor behavior might not reflect the expressed attitude. This is particularly the case in situations where the attitudes are expressed in general terms; most research literature points to the typically low predictability of such attitudes for estimating behavior (Wicker 1969). Heberlein and Black (1976) demonstrated that as the specificity of attitude scales increased from general environmentalism to measures of personal norms of non-polluting behavior, so did the correlations between the scales and behavior. However, the authors also noted that general attitudes remain important foci for study; they influence a wide range of specific beliefs and, indirectly, a number of behaviors.

While there are limitations to the use of attitudes by wilderness managers, we want to emphasize strongly that the systematic review of visitor attitudes is essential for effective management. Numerous studies point to the differences that exist between managers and visitors about a whole range of concerns (Hendee and Harris 1970; Peterson 1974a). Often the views of visitors differ significantly from those held by area managers, and it is important that these differences be clearly understood. In some cases the views of visitors will offer viable alternatives to managers. In those cases where manager perspectives prevail, it is important that effective programs identifying the rationale and basis for decisions be formulated.

Systematic attitude surveys also provide a means of balancing the selective perception that affects us all. Wilderness visitor surveys reveal a diverse body of opinion; not all visitors want facilities or oppose restrictions. The experiences that managers have in dealing with visitors can sometimes contribute to generalized conceptions about what visitors want or oppose that are simply inaccurate (Hendee and Pyle 1971). Systematic feedback on attitudes helps counter these misconceptions, thereby avoiding actions based on imagined concerns.

In the following review, we will examine the attitudes of visitors toward four broad areas of concern: management of environmental conditions, management of trails and access, management of campsites and facilities, and management of visitor use.

## Management of Environmental Conditions

Today, we largely take for granted the general condition of wilderness and appropriate uses and activities, in part because of the definition embodied in the Wilderness Act. But it is important to remember just how recent this codified definition is and how differing conceptions characterized the situation only a few years ago. The question of the appropriateness of resource exploitation activities, the control of fire or insects and diseases, or the role of active intervention in ecological processes was, less than three decades ago, something about which there was a great deal of diversity.

A brief review of some of the findings of Outdoor Recreation Resources Review Commission (ORRRC) Study Report 3 (1962) reminds us of this diversity of opinion as well as the crystallization of the wilderness concept as we know it today. The survey included visitors to the Mount Marcy area in the New York Adirondack Forest Preserve, the Boundary Waters Canoe Area in Minnesota, and a portion of California's High Sierra, including parts of Yosemite and Sequoia-Kings Canyon National Parks and the High Sierra Primitive Area.

The study provided clear evidence that most users considered wilderness as a place where exploitative activities should be limited. Between two-thirds and 85 percent felt wilderness should be left untouched and that resources, such as timber and minerals, in wilderness should not be utilized. Yet, from 16 to 34 percent were undecided or felt such resources should be utilized.

Respondents were also queried as to whether humans should try to control and manage wildlife and vegetation in wilderness or whether natural forces should be allowed to proceed with minimum interference. Again, the predominant response was in favor of the minimal interference approach; between 60 and 80 percent of the respondents preferred to let nature run its course. Nevertheless, between 20 and 35 percent indicated that control and management should be exercised.

These data indicate that scarcely two decades ago there was a significant minority view among wilderness visitors that such areas should be open to traditional resource development activities and that active environmental management was appropriate. As we continue this review, the dramatic shifts in opinion on these issues will become apparent. Yet they remind us of the constantly evolving nature of our conception of wilderness and the likelihood such conceptions will continue to change.

Even after passage of the Wilderness Act, ambivalence about management of the environment persisted. Hendee and others (1968) asked visitors to three wildernesses in the Pacific Northwest a series of questions about the appropriateness of selected resource management activities in such areas. Virtually all felt that human-caused fires and outbreaks of nonnative insects or diseases should be controlled as quickly as possible; nine out of 10 disagreed with the idea of allowing natural events, such as lightning-caused fires and infestations of native insects or diseases, to run their course; and a similar proportion supported the idea of artificial restoration of areas denuded by fire, insects, or disease.

These early data suggest that the conception of wilderness held by many visitors consisted of two parts. At one level, there was a general consensus that wilderness was a place of natural conditions where normal management activities were inappropriate. However, at a second level, there was a tendency to support intervention to control the outbreak of natural forces such as fire—a position that contradicted the more general level of support for minimum interference, but that was consistent with a conception of wilderness as a place of recreation and scenic beauty. This contrast between the general and the specific attitudes held by wilderness visitors is characteristic of attitudes in other domains. It is also reflective of a particular time in history; the concept of wilderness in the late 1950's and early 1960's was evolving and consolidating. The exact nature of those areas that were to be wilderness was not agreed upon, and the diversity of opinion, particularly at the specific level, reflects the different, often conflicting, views that existed at that time.

In the ensuing years, the conception of wilderness, especially within agencies, has taken on more specific form. Much of this specificity was shaped by the Wilderness Act itself; timber harvesting, for example, is simply not permitted. Moreover, the idea of wilderness as a place where natural forces predominate, where human intervention is the exception rather than the rule, has come to have greater acceptance. Consequently, our review of the literature did not reveal any recent studies that examined attitudes toward such issues of environmental management as insects or diseases. However, a major public policy issue concerns the role of fire in wilderness. A review of the shifting pattern of attitudes toward fire will help illustrate how rapidly such dispositions can shift, as well as indicate their relationship to the decision process.

**Fire.**—Although the Wilderness Act contains authority for the control of fire, it was recognized early that fire was perhaps the dominant force shaping the vegetative mosaic in many areas. Years of successful suppression had altered the natural successional process greatly, and it was clear that if such areas were to be areas where historical ecological processes operated substantially beyond human control, our attitudes toward fire and the expression of the attitudes in terms of organizational policy needed to change. Since passage of the Wilderness Act, we have seen an evolution from complete fire suppression to planned fires in some areas to help restore earlier disturbances.

Few other forces have played such a major role in giving form to wilderness. Moreover, few other environmental forces produce such deep emotional responses among the public. The fear of fire and its impacts, both environmental and economic, helped generate development of fire control policies and technologies that have brought fire under substantial control over the past 60 years.

Increasingly, however, there has been recognition that the control of fire in wilderness is contrary to the objectives of protecting natural ecological processes. Consequently, there has been a progressive switch from fire control to fire management. With this policy move, increased attention has been devoted to public attitudes. This is a relatively recent phenomenon; early studies of wilderness

visitors provided little coverage regarding attitudes about fire. For example, the ORRRC (1962) provided no direct data regarding attitudes about fire suppression policy, but did note that between 70 and 93 percent of persons sampled in seven areas felt trees should be replanted in burned areas within wilderness. Hendee and others (1968) investigated three wilderness fire-related items in their work on three Pacific Northwest wildernesses. Ninety-eight percent of respondents felt human-caused fires in wildernesslike areas should be put out immediately, 95 percent felt lightning fires should not be allowed to run their course, and 90 percent felt wildernesslike areas denuded by fire should be restored as soon as possible.

As interest in allowing fire a more natural role in wilderness ecosystems grew, more research attention on public attitudes toward fire occurred. Lucas (1980), reporting on his 1972 surveys of visitors to nine wildernesses and other roadless areas, found between 15 and 30 percent favored a natural fire policy, about one-third were neutral, and between 40 and 60 percent thought such a policy undesirable. In a 1982 followup in three of the previously studied areas, he found that support had reached nearly 50 percent, with less than one-third opposed (Lucas 1985). Visitor attitudes toward fire had clearly become more favorable.

Stankey (1976) studied the relationship between the attitudes that Selway-Bitterroot Wilderness users held about fire management and a number of other variables, including age, education, wilderness experience, and the respondent's score on a test of fire knowledge. He found that a policy of no suppression was rejected by most respondents, but 43 percent also rejected complete suppression. Overall, suppression was favored.

There was a strong relationship between the attitudes toward wilderness fire policy and knowledge of fire effects. As test scores rose, so did the likelihood the respondents would favor a modified suppression policy. A gamma of 0.57 was found between the test score and the number of times that policy was selected as "most acceptable." The more people knew about fire, the more they favored a policy of restoring a more natural role to fire.

The data from the Stankey study were collected in 1971, at a time when modified wilderness fire suppression was just becoming a major public concern. Later, McCool and Stankey (1986) repeated the study, using the same methodology, with visitors to the Selway-Bitterroot Wilderness. The average score on the fire knowledge test rose 11 percentage points, from 53 percent to 64 percent in the period. Moreover, there was a nearly 50 percent decline in 1982 in the percentage of individuals scoring in the very lowest category and a major increase in the percentage scoring in the highest two categories.

There was also a corresponding shift in attitudes toward appropriate fire suppression policies. In 1971, 56 percent of the users questioned favored a fire suppression approach. The 1984 study indicated that only about 17 percent favored these policies and only 5 percent supported complete suppression. Interestingly, only a very small percentage in either year supported a policy of completely letting all fires burn, suggesting that visitors remain unwilling to support extreme positions. Over 70 percent of the 1984 sample supported a policy of allowing some fires to burn in wilderness.

McCool and Stankey (1986) also report on visitor attitudes toward the use of scheduled prescribed fire or fire ignited by managers in wilderness according to an approved fire prescription. Nearly 50 percent felt that such scheduled prescribed fire would be beneficial while slightly more than one-third indicated they were "unsure." Only 16 percent felt that such fires would be detrimental. Of those aware of the practice of prescribed fire outside wilderness, 27 percent were unsure of the effects of scheduled prescribed fire in wilderness. This is in contrast to those who were unaware of prescribed burning; 51 percent were unsure of the effects of scheduled prescribed fire in wilderness.

## Management of Trails and Access

Trail systems are a primary influence on the movement of recreationists in a wilderness. They also have the potential to affect a visitor's experience in either positive or negative ways. Thus, trail management is an important component of wilderness management.

Trails are, by definition, impacts on the environment. In some areas, the lack of trails would make travel difficult if not impossible. Elsewhere, cross-country travel can be undertaken with little trail development. Trails are especially important for certain types of use, such as horseback travel.

But while trails are impacts that are generally acceptable and expected, it is clear there are limits to the nature and extensiveness of their development, the standards to which they are built, and the locations in which they are placed. Many trails that cross wilderness areas are a product of the period of major fire control and were intended to move people and equipment from one point to another quickly and efficiently; they were not designed to move people through a wilderness with minimum impact, or improve the quality of their experience.

A number of studies report visitor attitudes toward trails. Hendee and others (1968) summarized these attitudes, noting "Trails should be developed and maintained appropriate for the use received—of varied quality and not of uniformly high standard throughout wilderness-type areas." However, they also found little support for very low-standard trails (blazed routes) and even less support for trails surfaced with sawdust or woodchips to control dust.

Stankey (1973) found mixed opinion about appropriate trail standards. The response to providing more high-quality trails (no further definition was given) was evenly mixed among those favoring, those rejecting, and those neutral to such an action. Like Hendee and others (1968), he found that those users classified as being more purist in their wilderness orientation tended to be less supportive of high-standard trails. Among visitors to Idaho's Salmon River, Tarbet and others (1977) reported strong support for low-standard trails and leaving fallen trees across trails. This support appears particularly linked to the role of such practices in controlling access. Visitors appear to recognize that the quality of access can have an effect on the amount of use an area receives; the question as to what is an appropriate level of development for trails becomes enmeshed in the question of how access will affect the use of an area.

This concern with the effects of access on the use of an area surfaced in a study by Stankey (1980) comparing use in a lightly used wilderness in the Northern Rockies with use in a heavily used wilderness in California. In both areas, about half the respondents favored reducing the number of trails and the blocking of access roads back from the wilderness boundary as a way of controlling use. Again, it is possible to interpret these results as reflecting a particular disposition toward access into the area or as a way of controlling use other than direct regulation. The data do suggest that visitors recognize the important role access plays both in the amount of use an area receives and the distribution of that use. Lucas (1964b) found little support for the idea of straightening or blacktopping roads leading to the Boundary Waters Canoe Area—further evidence of the recognition by visitors that such developments can alter greatly the nature of use in an area.

Murray (1974) queried Appalachian Trail users as to their attitudes toward two possible trail management practices, including side trails to bypass rough or steep sections and marking trail sections as to their difficulty. In both cases, approximately three out of four respondents said they favored these steps or that it didn't matter. Those hikers with the most experience tended to differ slightly from others, being less favorable to both actions.

Echelberger and Moeller (1977) found that visitors to the Cranberry Backcountry in West Virginia were predominantly in favor of what they had; about four out of 10 said "don't change" when asked about adding more foot trails and providing areas with no trails. One-third did support more foot trails, but fewer than 20 percent favored the addition of areas with no trails. This status quo position is not unlike the response of many people about proposed changes in familiar settings. Womble and others (1978), in a study of hikers on Alaska's Chilkoot Trail, found many specific comments about the trail and its condition, but the predominant message was "keep the Trail as is."

A knowledge of trends in attitudes toward trail conditions is generally lacking. One important exception is found in data reported by Lucas (1985). His analysis revealed that between 1970 and 1982 in the Bob Marshall Wilderness complex in western Montana, support for high-standard trails, defined as wide, with steady grades and fairly straight, grew significantly (table 1). Complaints about trail conditions grew sharply in the 12-year period, becoming one of the major responses given by visitors to a question regarding perceived changes in the area. The sup-

port for high-standard trails is in contrast to the general support expressed by visitors for a more primitive, undeveloped approach to management. This is likely due to the severe deterioration in trail conditions in much of the area. Visitors traveling on horseback were more in favor of high-standard trails than were backpackers; the reverse was true for low-standard trails, defined as being somewhat like a game trail—narrow, grade varies, winding, not the shortest route. Over the study period, however, support for low-standard trails appears to have diminished slightly.

Trailless areas were strongly supported by respondents in the Lucas study and there was little change over the study period; 70 percent in 1970 and 73 percent in 1982 supported such areas and there was little difference between horseback and foot travelers.

The construction of bridges is another access-related issue. Different arguments are raised regarding such structures, but typically matters such as public safety and effects on use distribution are cited. In those studies where questions about bridges have been raised, the pattern appears to be one of public support. Stankey (1973) found that nearly two out of three persons favored the construction of wood bridges across wide rivers; safety is likely a factor in this response. Those visitors classified as more purist tended to be less supportive. Echelberger and Moeller (1977) found that Cranberry Backcountry users were split on the issue of bridges, with nearly half content with the current situation, but another third wanting more.

Again, Lucas (1985) noted a shift in attitude toward bridges over the period 1970-82, with the general trend toward increasing support. In response to an item "bridges over rivers that are dangerous for hikers to wade or for horses to ford," support rose from a four to one margin in 1970 to over seven to one in 1982. Support also grew for bridges over small creeks where one could get wet feet.

Signs represent an important component of the wilderness access system. Hendee and others (1968) examined a number of questions about signs. The overall conclusion was that people preferred wood signs, showing directions only (as opposed to interpretive messages), located at trail junctions rather than concentrated at trailheads. Those users classified as more purist showed a slight tendency to support the preferences expressed by the largest percentage of other users. The authors also noted that most ques-

**Table 1.**—Visitor opinions of high and low standard trails, 1970 and 1982 (source: Lucas 1985, p. 29)

| Year                                   | High standard  |         |             | Low standard |         |             |
|----------------------------------------|----------------|---------|-------------|--------------|---------|-------------|
|                                        | Desirable      | Neutral | Undesirable | Desirable    | Neutral | Undesirable |
| ----- Percentage of total visits ----- |                |         |             |              |         |             |
| 1970                                   | 45             | 23      | 33          | 63           | 22      | 15          |
| 1982                                   | A <sup>1</sup> | B       |             | A            | B       |             |
|                                        | 32 ± 3         | 40 ± 4  | 12 ± 3      | 52 ± 4       | 7 ± 2   | 23 ± 4      |
|                                        |                |         | 16 ± 2      |              |         | 18 ± 3      |

<sup>1</sup>In 1982, there were two possible desirable responses—A, "desirable," and B, "desirable in more heavily used parts of wilderness, but not in more lightly used parts."

tions produced a fairly large neutral response, ranging from 30 to 40 percent, suggesting a lack of clearcut opinions or simply that signs were of little importance.

Tarbet and others (1977) also found a lack of clear opinion with regard to signs among users on the Salmon River. The mean scores on four items related to signing all clustered on the neutral rating (an overall mean of 2.1 on a 3-point scale). The authors observed that experience likely plays a major role here; they note "infrequent users are likely to approve of these management techniques while frequent users might be opposed."

Lucas (1985) found that opinion about interpretive signs onsite shifted sharply over the period 1970 to 1982. While such signs were opposed by a two to one margin in 1970, they were favored by a small margin in 1982. Support was inversely related to experience; novices were supportive of such signs while experienced users were opposed.

The lack of signs marking trails was a major concern of visitors to the Linville Gorge and Joyce Kilmer/Slickrock Wildernesses (Roggenbuck and others 1982). Although problems with signing ranked among the top 10 as perceived by users, only about a fourth of the visitors, in fact, described it as a problem.

In summarizing attitudes toward trails and access, several points can be made. First, visitors want adequate access that accommodates their style of travel; muddy bogs are not adequate transportation networks for hikers or horseback travelers. Second, a diversity of trails is needed to accommodate different styles of travel as well as different experiences. For example, there is support for trailless portions in most areas but there is also support for areas of trail development. Third, much of the concern with trail systems does not focus on the extent of the system (indeed, there is support for maintaining what there is in most studies), but with the maintenance of that system. Finally, trails are perceived by virtually all visitors as an appropriate and necessary feature of the wilderness setting; bridges are also considered in keeping with the area's designation.

Adequate signing, including basic directional information, appears to be considered appropriate to most visitors. Moreover, the Lucas data (1985) suggest that even limited interpretive signing is not unacceptable to many. Under current Forest Service policy, these latter types of signs are prohibited; only signs providing routing information are permitted. Consequently, other types of information need to be provided by other means, such as maps or brochures. We will look at attitudes toward these techniques subsequently.

## Management of Campsites and Facilities

Campsites are a particularly important aspect of visitors' images of wilderness settings. For overnight visitors they represent locations where many of the wilderness values that prompted the visit are enjoyed. Because they are the foci of use, they receive a great deal of management attention; thus, important questions of appropriate development arise. In this section we review the findings of a number of studies that examined visitor attitudes toward campsite development and associated facilities such as toilets, corrals, and firerings.

Stankey (1973) asked visitors to three western wildernesses and the Boundary Waters Canoe Area (BWCA) if they favored more campsites. Only about 20 percent of those in the western areas favored this action. In the BWCA, nearly half of the respondents were in favor of such a step. The difference appeared related to the generally wide availability of sites in the West as opposed to the more constrained situation in the BWCA.

Echelberger and Moeller (1977) found opinion evenly split on the provision of walk-in primitive campgrounds in the Cranberry Backcountry, with about a third in favor of adding more, another third saying "don't change," and the final third with no opinion.

In a study of backcountry users in Michigan's Sylvania Recreation Area, West (1981) found that among those visitors reporting they felt crowded, about 70 percent favored keeping the number of campsites at current levels and another 20 percent favored a decrease in the number. Among those who did not feel crowded, 81 percent felt the current number of campsites was satisfactory and only 3 percent favored a decrease.

Merriam and Ammons (1967) reported little support for simple campgrounds (defined as including tables, stoves, hitching racks, and outhouses) in either the Mission Mountains Primitive Area or the Bob Marshall Wilderness, but slightly over half the visitors to the wilderness backcountry of Glacier National Park supported such developments.

Among river runners in Dinosaur National Monument, Roggenbuck and Schreyer (1977) found that more users opposed than favored campsite development suggestions. Users were even more opposed to returning campsites to a more primitive or natural condition than to the proposed development, suggesting that existing sites and their condition are generally found satisfactory by users.

These limited data provide reasonably clear evidence that any appreciable effort to expand the number of wilderness campsites has little visitor support. From a management perspective, conducting inventories of potential sites could be useful as a means of reducing impact and crowding at existing sites; visitors might feel such efforts simply lead to more use. Also, the idea of providing more campsites in wilderness might conjure up images of car access style campgrounds that visitors see as inappropriate.

**Toilets.**—Toilet facilities are a concern in many areas. Problems of threats to human health and objectionable esthetics have led many to consider whether some type of installed toilet facility is desirable. ORRRC Study Report 3 (1962) initially pursued this matter, discovering wide-ranging opinion in their three study areas; 70 percent of visitors supported toilet facilities in Mount Marcy, 50 percent in the BWCA, but only 36 percent in the High Sierra. Shortly after the ORRRC study in the BWCA, Bultena and Taves (1961) reported that nearly 80 percent of the canoeists they interviewed there rated toilets as important.

Hendee and others (1968) found that about half of the respondents in their study supported toilet facilities in wilderness, but those rated more purist in attitude tended to strongly oppose such facilities.

Stankey (1973) found a variable pattern of support for toilets across the four study areas he investigated. Consistent with earlier findings, visitors to the BWCA were

most supportive—nearly two-thirds favored placement of toilets. In the West, only about one-fourth of the visitors to the Bridger Wilderness and High Uinta Primitive Area favored toilets, but 43 percent of visitors to the Bob Marshall did. Two likely possibilities explain these results. First, the support for toilets is based on their perceived need. In the BWCA, for instance, the extensive water area and limited soil cover help contribute to concerns about pollution, particularly because most campsites are on lakeshores. Thus, toilets are seen as a way of controlling a potentially serious problem. Second, the presence of toilets (or other facility) likely contributes to acceptance; at the time the study was conducted, toilets were still commonly found in the Bob Marshall.

Lucas' trend study (1985) reported that while toilets were equally supported and opposed in 1970, opposition to them grew to a two to one margin by 1982. Womble and others (1978), however, reported that 80 percent of the hikers on the Chilkoot Trail felt toilets were an appropriate facility along the trail; it is likely hikers perceive the Chilkoot to be more of a "historic" trail than one traveled for its wilderness appeal. Schreyer and others (1976) also found that whitewater travelers saw toilets as appropriate, but preferred pit toilets to more developed restrooms. Again, visitor attitudes appear linked to site-specific characteristics and these make simple generalizations regarding support or opposition difficult.

**Firerings and Fireplaces.**—Other facilities that have attracted management concern are firerings and fireplaces. There are concerns that permanent firerings attract use; in many areas it is common practice for wilderness rangers to dismantle them with the idea that users will not always camp at the same location, thereby reducing site impact. On the other hand, there is concern that fires can lead to site impacts, such as soil sterilization (Cole and Dalle-Molle 1982) and that dispersing firerings will simply increase the aggregate area so affected.

A variety of studies have probed visitor attitudes toward firerings and fireplaces. Early studies (for example, Bultena and Taves 1961) suggested in general that such facilities were acceptable in wilderness. Lucas (1964b) found that canoeists in the BWCA favored movable firerings to iron and cement fireplaces. Hendee and others (1968) reported substantial opposition to permanent fireplaces in wilderness, particularly by purists; about 50 percent endorsed movable rock fireplaces, with the purists slightly more inclined to agree. Schreyer and others (1976) found that among river runners in Dinosaur National Monument, most were strongly opposed to a ban on open fires and strongly in favor of retaining fire grates; however, nearly one-half were opposed to requiring fire pans.

Lucas (1985) reported a fairly major shift in visitor attitude toward firerings and fireplaces. Whereas cemented rock fireplaces were opposed by a three to one margin in 1970, this had grown to four to one by 1982. Moreover, while loose rock firerings had been only narrowly favored in 1970, in 1982 they were favored by a 47 to 29 percent margin.

Results from research suggest that visitors find limited facilities for fire use appropriate and acceptable, with temporary firerings more acceptable than fireplaces. The practice of removing and scattering rocks from firerings

probably does little to eliminate an unwanted impact from the visitor's perspective and might produce undesired environmental impacts.

**Shelters.**—Although typically prohibited in classified wilderness, permanent shelters do exist in many primitive, undeveloped areas; Washburne and Cole (1983) reported that 12 percent of the units in the National Wilderness Preservation System contain such developments. Some shelters have historical significance, but most are valued for their protection from the weather and, in some cases, wildlife. Hendee and others (1968) found that nearly 60 percent of visitors agreed that three-sided shelters for hikers were consistent with an area being wilderness, but purists showed a moderate tendency to oppose them. In Glacier National Park, nearly 80 percent of the respondents favored trail shelters, but in adjacent National Forest wildernesses, they were opposed by a majority (Merriam and Ammons 1967). On the Chilkoot Trail, nearly 85 percent of the hikers felt shelters were appropriate (Womble and others 1978). Again, the level of support for some action appears conditioned by the context in which it exists. Where they have existed previously or where there are mitigating circumstances that support their presence, visitor attitudes typically are supportive.

**Stock Facilities.**—A final type of facility includes developments related to stock use in wilderness and backcountry areas, including fences, corrals, hitching racks, and the like. Hendee and others (1968) reported a general pattern of opposition to such developments, typically with 40 to 50 percent expressing opposition and only 20 to 30 percent in favor. The fairly large block of remaining opinion was neutral, suggesting many people had either not thought about the issue sufficiently to form a position or were genuinely unable to express their view.

Stankey (1973) found fairly strong opposition to the provision of hitching racks and corrals; only 20 percent favored them and half were opposed. Even in the Bob Marshall, where horse use is common, only about 25 percent were in favor; interestingly, there was little difference in support between backpackers and horseback travelers. Lucas (1985), however, found a different pattern with regard to the provision of pole corrals at campsites; in 1970 they were favored by a four to three margin, while in 1982 they maintained a very narrow margin of support. In both years, horsemen were much more favorable toward such facilities than backpackers. The reason for the difference in the two studies' results is not clear, especially given the difference in support among horse users.

In summary, the pattern regarding campsites and associated facilities seems to suggest a trend toward support for more primitive, nonconvenience-oriented approaches. The appropriateness of any given facility seems tied to a clear recognition on the part of the user as to the need and rationale for the facility, and where this can be demonstrated support likely follows. Also, where a facility has existed previously, there tends to be more support for it than where it would represent a new addition to the setting. In both cases, any effort on the part of management to change the status quo will need to be paired with a major effort to communicate the reason for such a change; otherwise, public opposition will likely occur. Facilities

geared to a particular class or type of user are typically supported by that user, but this is not always the case; in a horse use area, uniform support for a decision to allow pole corrals cannot be assumed.

The move to a more self-reliant, less convenience-oriented user probably has its roots in two areas: the growing availability of equipment that fosters independence (such as high-quality, self-contained petroleum stoves) and the many efforts by agencies and organizations to promote more independent styles of wilderness travel.

## Management of Visitor Use

Much wilderness management involves the management of use. Lucas (1973) observed that the issue is not so much a matter of whether such management will occur, but rather a matter of how it will be implemented.

There are many specific approaches to managing wilderness use, but in this review we have organized the presentation along three lines: management of information; management of recreation behavior; and direct use limitations, including quotas and rationing.

**Attitudes Toward Information as a Management Tool.**—There is much interest among both managers and users as to the potential role of information and education as tools for management and as alternatives to regulation and control. In many areas, much of the future management task will be hinged on an improved program of information dispersal to visitors. Recently the Chief of the U.S. Forest Service defined the wilderness management challenge as being “80 to 90 percent education and information and 10 percent regulation” (Peterson 1985).

Visitors appear to agree. Most studies reveal a decided preference for those management actions involving information and education approaches. Roggenbuck and others (1982) found the most popular management strategy in three eastern wildernesses was the provision of better information on use; nine out of 10 respondents in each area favored this strategy. Stankey (1973) concluded from his study of users in four areas that actions influencing use in more subtle, discrete ways, such as through the use of maps, were rated more favorably by users than direct, heavy-handed techniques. For example, 50 to 60 percent of the users in all areas were supportive of better maps and information pamphlets, with purists slightly less so inclined, possibly because of concerns that such information might increase use in the area.

Another source of information is the wilderness ranger program. Although these people have many duties, informing visitors of rules, appropriate behavior, and low-impact camping techniques is an important responsibility. Wilderness rangers are seen in an almost uniformly positive fashion by visitors; Stankey (1973) reported that 60 to 70 percent of the respondents favored the presence of rangers, and Lucas (1985) found a five to one margin in their favor in both years of his trend study. Hendee and others (1968) found that two-thirds of their sample disagreed with the idea that it is not necessary to patrol backcountry areas regularly. In West Virginia's Cranberry Backcountry, Echelberger and Moeller (1977) found that nearly two-thirds of the visitors felt regular ranger patrols

would improve the quality of the experience. Virtually nowhere is there any evidence that wilderness rangers are an unwelcome intrusion on the visitor's experience.

Wilderness managing agencies have worked hard to inform and educate visitors in minimum-impact techniques. This approach is attractive for a variety of reasons. It takes managers out of the “policeman” role they can easily evolve into under a regulatory approach. Given the generally high level of educational attainment of wilderness visitors, a management strategy focused on the provision of information, coupled with a rationale, is likely a highly effective approach.

Lucas (1985) concluded that some of these agency efforts are paying off. In 1970, most visitors said burying unburnable trash was desirable, but in 1982, over two to one said it was undesirable. Also, in 1982 over 90 percent said that packing unburnable garbage out of the wilderness was desirable.

Thus, it appears that educational messages can result in changes in attitude. Linkage to behavior is, of course, another question. It also remains a question as to whether an educational approach to wilderness management can control effectively all the various problems that arise. To the extent that it cannot, other strategies employing regulation or even limitation might have to be instituted. What visitor attitudes exist toward these approaches?

**Management of Recreation Behavior.**—A wide number of techniques have been and could be implemented that focus on specific aspects of recreation behavior such as where people camp, how long they stay, or how many people are in a party.

Stankey (1973) asked respondents their opinion about two measures that would affect access into, and within, the wilderness. First, visitors were asked to respond to the idea of reducing the number of signs and trails within the area (in the BWCA, the idea was to “leave portages rough so that only those persons willing to make the effort could visit the area”). Overall opinion was split, with 41 percent favoring and a similar percentage opposing it. In the West, only about a fourth of those on horseback supported it, a reflection of concern with their ability to travel through an area. Overall support in the BWCA was a bit higher, with 47 percent in favor; surprisingly, there was no difference in support between paddling canoeists and those using outboard motors. Purists generally were more inclined to favor the action than other users.

Stankey also asked visitors about the idea of blocking off the access road at some point so that the hike to the wilderness would be longer, thereby likely filtering off some use. About 40 percent of the visitors in the three western areas rejected this approach, and in the BWCA 60 percent opposed it.

Roggenbuck and others (1982) asked visitors in the East their attitudes toward building more trails and the assignment of departure points as techniques for distributing use. The assignment of departure points received little support, with less than a fourth in each area favoring it. Between a third and a half favored building more trails.

There is an ambivalence on the part of many users toward various use distribution techniques. This ambivalence likely derives, on the one hand, from the feeling that such measures could help reduce crowding and perhaps resource impact, but on the other hand, they might simply

stimulate more use or spread impacts. However, perceived trade-offs such as these are seldom controlled in research. Thus, ambivalence might also be a function of differing assessments of the benefits and costs of these strategies.

Another common management action involves limiting party size. The rationale behind such action is that large parties might have a disproportionate impact on both the experiences of other users as well as the environment. Today, party size limits, typically between 10 and 25 people, have been established for most wilderness areas (Washburne and Cole 1983).

Party size limits are well accepted by visitors. Tarbet and others (1977) found that a group limit of 12 was rated favorably by Salmon River visitors. A similar group limit was endorsed by nearly half the Chilkoot Trail hikers (Womble and others 1978). In three eastern wildernesses, between 70 and 80 percent of the visitors supported a limit on group size (Roggenbuck and others 1982). Roggenbuck and Schreyer (1977) found that 84 percent of river runners in Dinosaur National Monument favored some sort of maximum group size. Lucas (1985) found that opinion about party size limits remained stable over the 12-year period in the Bob Marshall Wilderness complex, with over half supporting a 12-person limit and only about 20 percent opposing it.

Stankey (1973) found a range of attitudes toward party size limits. In the BWCA, opinion was split, with half opposing such action and half either supportive or neutral. About two-thirds of the paddling canoeists supported limits, while two-thirds of the motor boaters opposed them. Among visitors to the Bridger Wilderness, 70 percent favored a limit on party size. In the Bob Marshall and High Uintas, 30 and 40 percent, respectively, favored restrictions on the size of horse parties. Both areas receive significant horse use. Although a party size limit of, say, 12 would affect primarily horse groups, an analysis controlling for method of travel provided only limited evidence that backpackers supported such limits as a way of controlling horse groups; 62 percent of backpackers supported a limit of 12, but so did 55 percent of the horsemen.

In a study comparing use and attitudes in a lightly used wilderness with those in a heavily used area, Stankey (1980) examined visitor views regarding party size restrictions. In the heavily used Desolation Wilderness in California, eight out of 10 agreed there should be a limit to the size of parties visiting a wilderness, while in the lightly used Spanish Peaks in Montana, only about half agreed. Among those in both areas who felt such a limit was needed, about three-fourths felt a limit of no more than 10 people was acceptable. In the Desolation, where there is little stock use, nearly 40 percent said there should be no stock allowed, while another 40 percent felt between one and four animals would be acceptable. As with many other attitudes, dispositions are shaped by local conditions and experiences. Where these are relatively stable across areas, useful generalizations can often be made, but where sharp local differences exist, it is more difficult to make such statements.

One type of direct regulation that has received much attention in the literature involves assignment of recreationists to campsites. The rationale is that such a program

could help reduce crowding at sites and could also help protect certain fragile settings.

Visitor response to campsite assignment, however, is generally negative. Echelberger and Moeller (1977) found that 42 percent of the respondents in the Cranberry Backcountry said assigning campsites would reduce the quality of the experience and only one-third thought it would improve quality. On the Chilkoot Trail, 57 percent of the hikers disagreed with such an action; one-third did support it (Womble and others 1978). Stankey (1973) found very strong opposition to campsite assignments, with over 80 percent of the visitors opposed to them and only 6 percent supportive. In a 1980 investigation, Stankey found that assigning campsites was rated less favorably than charging a fee by visitors to the Spanish Peaks and the Desolation Wilderness; only 23 and 17 percent, respectively, approved of such a step. Roggenbuck and others (1982) found only about 20 percent of the visitors in three eastern wildernesses supported campsite assignment. Lucas (1985) reported a stable pattern of disapproval to campsite assignment (roughly three-fourths opposed) in his study of trends in wilderness use between 1970 and 1982.

An exception to this general trend is found among some whitewater river runners. In Dinosaur National Monument, river runners favored an assignment system four times more than they opposed it (Roggenbuck and Schreyer 1977). This appears associated with the limited availability of campsites along the river and the feeling on the part of users that such a system offers more certainty for finding a campsite at night. In terrestrial wilderness settings, it appears most visitors prefer searching for sites and expect, even in heavily used areas, that they can find one suitable to their tastes. Even being unable to locate a desirable site, however, appears preferable to being assigned where they have to camp, a step that seems to strike at the spontaneity and freedom that motivate much use.

Schreyer and Nielson (1978) found a mixed response to assigned campsites by river runners in Westwater Canyon on the Colorado River and Desolation/Gray Canyons on the Green River. Over 55 percent of the Westwater users favored such a system, with about a third opposed; however, on the Desolation, the percentages were exactly reversed.

These and many other regulations of wilderness visitor behavior have been implemented with varying success. Use conditions and associated impacts, however, can reach a point where such regulations cannot accomplish area management objectives. At this time, it might become necessary to implement controls on use numbers through some form of rationing. In the last part of this section, we examine visitor attitudes toward direct use restrictions.

**Direct Use Limitations.**—The idea of restricting entry to wilderness is, in many ways, an anathema. The very idea of wilderness suggests freedom and a lack of control; restricting that freedom through the imposition of limits seems to strike at the very heart of what wilderness is all about. The dilemma arises, of course, from the fact that the view of wilderness as an unrestricted commons can lead to use levels that jeopardize the important social and ecological values such areas contain.

Despite these concerns, many users express a general willingness to accept limitation. One exception was reported by Hendee and others (1968); almost five out of 10 persons did not feel that use of wilderness-type areas needed to be restricted and only 30 percent agreed it did. However, these data were obtained over 15 years ago, at a time when use in many areas had not reached the levels it since has. Lucas (1985) found that visitors in both 1970 and 1982 strongly supported the idea of "restricting the number of visitors to an area if it is being used beyond capacity" (no definition of capacity was given); over three-fourths answered that this was desirable and only 12 to 14 percent said it was undesirable. Tarbet and others (1977) found that the management option of restricting the number of users received a mean score of 2.9 on a scale of 3 (with 3 being desirable); this was the highest mean score recorded on any possible management action about which visitors to the Salmon River were asked.

Stankey (1980) asked visitors to the Spanish Peaks Primitive Area and Desolation Wilderness to respond to three statements concerning how they felt about management actions that should be taken if use were to continue to increase. First, it was suggested:

It would be better to be able to go to the wilderness whenever you want to, even if it was being used beyond capacity, than to have any kind of regulations on use.

In response to this item, 83 percent of the Desolation visitors and 74 percent of the Spanish Peaks visitors expressed disagreement. It is clear from the response that unrestricted entry, when capacity has been exceeded, is not acceptable. Desolation visitors were more inclined to disagree with the statement than Spanish Peaks users, but this seems consistent with the much higher use there.

Users were then asked to comment on two additional items:

There should be restrictions on how many people can be in a wilderness at any given time.

and

If a wilderness becomes overcrowded, restrictions on the number of people allowed to visit it should be enforced.

About half of the Spanish Peaks visitors agreed with the first statement; in the Desolation Wilderness, nearly nine out of 10 agreed. However, in the second item, which at first appears to merely restate the first, the differences in attitudes between the two were much less sharp, although still statistically significant; nine out of 10 of the Desolation visitors agreed with it, and three out of four of the Spanish Peaks visitors also agreed. The difference appears linked to the fact that the first statement proposes use restrictions without considering carrying capacity. In the Spanish Peaks, where use levels were low and most visitors felt the area's capacity had not been exceeded, only about half agreed with it, but nearly 90 percent of the Desolation Wilderness visitors agreed with the statement, an outcome that can probably be attributed to the high use levels currently found in the Desolation.

With regard to the second item, support for restricting use when the area became overcrowded grew sharply in the Spanish Peaks; by adding the crowding proviso, the item took on a condition with which most Spanish Peaks visitors could concur.

Interarea differences in use also yielded differences in attitudes toward control in three eastern wildernesses studied by Roggenbuck and others (1982). The major difference among areas was when the need to impose controls might arise. In the Shining Rock, which has one of the highest use densities in the country, nearly one-fourth thought controls were needed immediately to lower use, another 30 percent thought they were needed now to hold use at current levels, and nearly 40 percent thought they would be needed in the future. In the Joyce Kilmer/Slickrock, on the other hand, a lightly used area by eastern standards, the majority of users felt controls would be needed, but only in the future and when overuse occurred. In all areas, there was little support for the idea that controls were not needed at present or in the future.

Bultena and others (1981b) found strong opposition among Mount McKinley (Denali) National Park backpackers toward allowing uncontrolled use levels in the backcountry. Womble and others (1978) found divided opinion among Chilkoot Trail users; in response to the item "the number of hikers on the Trail at any given time should be limited," 37 percent agreed and 38 percent disagreed, while in response to "the number of hikers in camping areas at any given time should be limited," an identical 39 percent agreed and disagreed. A wide variety of reasons for these views were presented, ranging from support based on concerns for resource protection, to opposition based on concern for the protection of personal freedom, and even some based on the fact that historically there had been no limits to the Trail. Schreyer and Nielson (1978) found that only about 6 percent of white-water river runners were in favor of removing all restrictions on the number of users on rivers; between 80 and 90 percent were opposed to such a move.

While there is generally strong support for the idea of restricting wilderness use, particularly when problems of crowding or resource impact are imminent, how should such restrictions be implemented and what public attitudes exist toward these different measures? Many specific techniques have been proposed to restrict use. Each carries a different type of cost and impacts different users. Consequently, we would expect different types of users to hold different opinions about these various alternatives, opinions shaped in part by how they see the action affecting them (Stankey and Baden 1977). Five broad strategies of use restriction can be identified. These include (1) queuing (first-come, first-served), (2) reservation, (3) pricing, (4) lottery, and (5) merit.

1. Controlling use through a queuing or first-come, first-served system is a common way of regulating entry to a scarce resource. In the wilderness situation, it tends to favor the local user or the person with abundant time (Stankey and Baden 1977). Stankey (1973) found that 28 percent of respondents favored a first-come, first-served system, with another 18 percent neutral; thus, nearly half were in favor or not opposed while slightly over half were not in favor. Consistent with the resident bias noted above, he found greater support in the Bob Marshall Wilderness, where most users were locals, than in the Bridger Wilderness, where nonresidents were predominant. Later, Stankey (1980) found that Desolation Wilderness visitors favored the first-come, first-served approach substantially more than did Spanish Peaks visitors

(57 to 41 percent). Both areas draw their use predominantly from local areas; over 90 percent of Desolation visitors come from California and over 70 percent of those in the Spanish Peaks come from Montana (Lucas 1980). However, the Desolation Wilderness is one of the most densely used areas in the country while the Spanish Peaks is one of the lightest (Stankey and others 1976). Consequently, Desolation visitors tended to be more supportive of all use control measures than did Spanish Peaks visitors. Moreover, a mandatory permit system in effect at the time of the study in all California wildernesses, distributed in part through a first-come, first-served system, likely resulted in more visitors there being familiar with it.

Roggenbuck and others (1982) also found fairly strong support for queuing. Support ranged from 41 to 52 percent. The Linville Gorge had such a program in effect at the time of the study, and 50 percent of the respondents indicated support for it.

Only slightly more than a fourth of the whitewater river runners surveyed by Schreyer and Nielson (1978) favored a first-come, first-served system. Commercial passengers in Westwater Canyon were more in favor of this system than were the private runners, but this ranking was reversed among the Desolation users.

Although a first-come, first-served system tends to favor local users, Bultena and others (1981a) found strong support for such a system among backpackers in the Mount McKinley backcountry—82 percent of the users supported this system. It should be noted that the permits for Mount McKinley backcountry use were distributed through a first-come, first-served system; thus, users were familiar with it.

2. Another common system involves reservations. A reservation system tends to favor those able and willing to plan ahead and whose time commitments are more predictable (Stankey and Baden 1977). However, when reservations can be obtained freely, there is a tendency for people to obtain them even if there is only a small chance they might eventually use them, often resulting in a large share of “no shows,” resulting in a suboptimal allocation of the resource. Stankey (1973) found opinion fairly evenly split among wilderness users; overall, 43 percent supported a reservation system and 39 percent opposed it. Nearly one person in five was neutral. Among purists, the reservation system was rated as most favorable.

Stankey (1980) found a sharp split in opinion in his study of the Spanish Peaks Primitive Area and the Desolation Wilderness. Only 29 percent of the Spanish Peaks visitors favored a mail reservation system, but in the Desolation, 59 percent did so. The familiarity that Desolation visitors had with a mail reservation system then in effect in California probably accounted for much of the difference. This appears to be the case in a study reported by Roggenbuck and others (1982) where 85 percent of the Linville Gorge visitors supported an advance reservation system (and where such a program was already in place), while in the Shining Rock and Joyce Kilmer/Slickrock Wildernesses, two-thirds of respondents supported such a system. In a study of river runners on the Middle Fork of the Salmon River in Idaho, Utter and others (1981) found strong support for reservation systems, likely reflecting the fact that such users typically are more familiar with such systems than most backpackers.

Schreyer and Nielson (1978) reported strong support for a reservation program among whitewater river runners; about 80 percent of those surveyed in the Westwater and Desolation Canyons favored such a program. Commercial passengers were more strongly in favor of the advance reservation program than were private runners.

Nearly half (46 percent) of Mount McKinley backpackers opposed an advance reservation system (Bultena and others 1981a) while 37 percent supported it and 14 percent were neutral.

3. One of the most common techniques in society for the allocation of scarce resources is pricing. However, when considered as a mechanism for the allocation of recreation and amenity resources in general, or wilderness in particular, pricing is often seen as unacceptable or inappropriate.

Nevertheless, several studies have looked at the use of pricing as a way of limiting use. One study (Hendee and others 1968) asked if visitors would be willing to pay some charge to help defray the costs of backcountry administration and management. More than four out of 10 persons were willing to do so, one-third were opposed; those persons who were classed as more purist in attitude were particularly opposed to such a charge.

The notion of a fee has received some support. Even at the time of the ORRRC Study (1962), charging for wilderness entry received support. That study asked, “If it were necessary to charge a yearly license fee in order to preserve wilderness, what would be the maximum price you would be willing to pay?” Slightly over a fourth replied “nothing” but another fourth replied between \$3 and \$5.

Stankey (1973) also found about a fourth of respondents favored a fee while 20 percent were neutral. Among purists, there was mixed opinion; overall, about 45 percent opposed a fee, but the percentage favoring one ranged from 23 to 53 percent among the different areas. This pattern persisted in Stankey’s 1980 report on the Spanish Peaks Primitive Area and Desolation Wilderness. About one-fourth of Spanish Peaks visitors and one-third of Desolation visitors supported a fee. It also prevailed in a study of users in three eastern wildernesses (Roggenbuck and others 1982) where about one user in five supported it. Two-thirds of the respondents in the Mount McKinley backcountry opposed a fee and only one in 10 supported it (Bultena and others 1981a). Still, nearly 20 percent were neutral to the idea of charging.

4. The concept of a lottery as a means of allocating wilderness use opportunities has been proposed as a system that would eliminate many of the advantages and disadvantages of other distributive systems (Hardin 1969). In this system, much as in the programs that many States have implemented to allocate certain hunting permits, one’s chance to visit an area would ride on the “luck of the draw.”

It appears that many people are not willing to leave their wilderness visits to chance. In the four studies reviewed where attitudes toward a lottery were examined (Stankey 1973, 1980; Bultena and others 1981a; Roggenbuck and others 1982), it was the least favored of all rationing programs, ranking even below the imposition of a fee. Overall, support ranged from a low of about 6 percent to a high of around 18 percent. These results persist over a wide geographic area and over a period of 10 years, altogether a remarkable measure of stability.

A lottery also rated poorly among whitewater river runners. Overall, only about 20 percent of those surveyed by Schreyer and Nielson (1978) favored a lottery, and although private river runners were more supportive than the commercial passengers, a majority of both groups opposed a lottery. One exception to this general pattern is in Utter and others' (1981) study of river runners where they found support for the use of lotteries.

5. Rationing by merit received much attention in an article by Hardin (1969) and, even today, has many advocates. Many of the ideas underlying the concept of minimum-impact camping originate from the merit idea. The basic concept is that by requiring individuals to have some minimum level of skill and knowledge about use of the backcountry, many undesirable impacts can be eliminated, thereby reducing the need for restrictions.

Only limited data exist regarding visitor attitudes toward such an approach. Stankey (1980) asked visitors to the Desolation Wilderness the degree to which they favored or opposed being required to take a test of their wilderness skills and knowledge. Nearly six out of 10 supported such a policy. Utter and others (1981) found that a majority of users on the Middle Fork of the Salmon River supported a merit option, although the item as presented in the questionnaire might have led people to believe that it referred to their guide's experience and not their own. Bultena and others (1981a) reported substantial opposition to such an approach, with half of the Mount McKinley

backpackers surveyed opposed and only about a fourth in favor.

Shelby and others (1982) examined the attitudes of river runners and backpackers toward the five general use rationing programs we have reviewed in terms of four criteria: their effect on the chance of obtaining a permit, their fairness, their acceptability to users, and the willingness of users to try them. The results (table 2) indicate that pricing and reservation systems rank highest with regard to all the criteria for both river runners and backpackers, with one exception: a merit system is seen by backpackers as having less effect on them than a reservation system.

Most studies reviewed here have tapped the attitudes of visitors toward the various rationing schemes in a hypothetical or abstract sense. However, two studies have reported attitudes toward a specific program. Fazio and Gilbert (1974) surveyed backcountry users in Rocky Mountain National Park to determine their reaction to a program instituted to control overnight use. People were surveyed both before and after they visited the area. Although people were required to wait for up to 1½ hours to obtain a permit, 69 percent of those queried in the pretest and 86 percent of those in the followup survey viewed the system as necessary. Even among those unable to obtain a permit, 80 percent still saw the permit system as necessary.

**Table 2.**—Percentages of users agreeing with four assessments of allocation alternatives  
(source: Shelby and others 1982, p. 418)

| Allocation<br>alternative                           | River runners             | Backpackers            |                            | Chi square <sup>1</sup><br>(d.f. = 2) |
|-----------------------------------------------------|---------------------------|------------------------|----------------------------|---------------------------------------|
|                                                     | Hells Canyon<br>(N = 295) | Eagle Cap<br>(N = 118) | Mt. Jefferson<br>(N = 261) |                                       |
| ----- Percent -----                                 |                           |                        |                            |                                       |
| Little or No Effect on Chances of Obtaining Permits |                           |                        |                            |                                       |
| Pricing                                             | 48                        | 70                     | 54                         | <sup>2</sup> 13.12                    |
| Reservation                                         | 64                        | 56                     | 45                         | <sup>2</sup> 35.07                    |
| Lottery                                             | 31                        | 20                     | 19                         | <sup>2</sup> 11.41                    |
| Queuing                                             | 14                        | 41                     | 38                         | <sup>2</sup> 47.27                    |
| Merit                                               | 37                        | 66                     | 66                         | <sup>2</sup> 46.69                    |
| System Is Fair                                      |                           |                        |                            |                                       |
| Pricing                                             | 45                        | 49                     | 43                         | 1.51                                  |
| Reservation                                         | 78                        | 50                     | 48                         | <sup>2</sup> 53.14                    |
| Lottery                                             | 39                        | 19                     | 21                         | <sup>2</sup> 26.16                    |
| Queuing                                             | 12                        | 34                     | 29                         | <sup>2</sup> 36.08                    |
| Merit                                               | 23                        | 24                     | 34                         | 7.45                                  |
| System Is Acceptable                                |                           |                        |                            |                                       |
| Pricing                                             | 66                        | 66                     | 55                         | 5.85                                  |
| Reservation                                         | 95                        | 73                     | 74                         | <sup>2</sup> 46.19                    |
| Lottery                                             | 50                        | 28                     | 30                         | <sup>2</sup> 23.97                    |
| Queuing                                             | 25                        | 50                     | 51                         | <sup>2</sup> 40.40                    |
| Merit                                               | 37                        | 42                     | 49                         | 5.91                                  |
| Willing to Try System                               |                           |                        |                            |                                       |
| Pricing                                             | 62                        | 68                     | 64                         | 1.16                                  |
| Reservation                                         | 84                        | 71                     | 64                         | <sup>2</sup> 32.32                    |
| Lottery                                             | 51                        | 35                     | 37                         | <sup>2</sup> 11.88                    |
| Queuing                                             | 16                        | 53                     | 55                         | <sup>2</sup> 96.35                    |
| Merit                                               | 36                        | 56                     | 60                         | <sup>2</sup> 32.97                    |

<sup>1</sup>Chi squares are based on 3 × 2 tables comparing responses across the three user groups.

<sup>2</sup>p < 0.005.

Similar results were obtained by Stankey (1979b) in a study of use rationing in two southern California wildernesses. He found that among successful applicants, 82 percent supported implementation of the rationing system and only 5 percent opposed it. And as Fazio and Gilbert had reported, even unsuccessful applicants supported the system; 81 percent were in favor of it and only 5 percent were opposed.

The conclusions of Shelby and others (1982) mirror those that we derive from this review of visitor attitudes toward the various rationing schemes. Users generally support the idea that management policies need to be implemented to protect the quality of wilderness and backcountry experiences. There is a recognition that unlimited use is not consistent with the kinds of conditions and experiences such areas are to provide. However, when we consider specific techniques, the characteristics of different areas, activities, and clients affect judgments of their appropriateness. Because each system imposes different impacts on users, it is necessary to consider the specific characteristics of an area and its use to determine the most appropriate approach.

Bultena and others (1981a) offered important evidence as to how the orientation of visitors affects their appraisal of different management policies. Overall, their data showed that the backcountry policies at Denali National Park, although restrictive, were endorsed by most visitors. Within this broad pattern of support, however, there were sharp differences of opinion, revolving largely on the underlying orientation of the respondent toward wilderness. The investigators considered how the appraisal of different management policies varied according to the importance respondents placed on solitude and their preference for resource development (the extent to which they favored the provision of more facilities in the backcountry). As table 3 shows, those backpackers seeking solitude were also those most supportive of the need for rationing and of the existing management policies in the park. Conversely, those most development-oriented were the least supportive of rationing and the park's restrictive use con-

trol measures. However, there were generally no differences based on the alternative orientations toward specific rationing steps.

## Summary of Attitudes About Management

In reviewing the results of the many studies discussed in this section, several general conclusions can be made. First, although the studies have been conducted over an extended time, over a wide geographic region, and have involved differing methods, sampling approaches, and questions, it is still possible to obtain some clear patterns regarding visitor attitudes toward management. Everyone does not have their own unique conception about how to manage wilderness. In fact, one of the major benefits of a review such as this is to help "tease out" some of these patterns and clusters of beliefs and to help managers better understand how these patterns relate to the actions they undertake and the decisions they must make. While some patterns do emerge, it is important to note that there is considerable variation in the attitudes of wilderness visitors toward management. Yet, many of these variations are related systematically to other factors, such as method of travel.

Second, although we can discern certain patterns in our review, it is difficult to ascertain trends in these patterns. With few exceptions, the body of research on visitor attitudes toward management is derived from cross-sectional studies, with limited comparability from one study to another. No longitudinal studies have been conducted; consequently it is difficult to assess what changes, if any, have occurred over time. Our review leads us to conclude that some marked changes have likely occurred and the trend study by Lucas (1985) supports this. There appears to be a move toward more appreciative, less consumptive styles of use, declining support for developmental responses to problems, increasing support for educative and information-based management responses, and a base of support for use restriction when conditions warrant it.

**Table 3.**—Relationships of hikers' solitude and development orientations to their attitudes toward rationing and existing management policies (source: Bultena and others 1981a, p. 307)

| Policy domain                                             | Orientation |                    |             |
|-----------------------------------------------------------|-------------|--------------------|-------------|
|                                                           | Solitude    | Gamma <sup>1</sup> | Development |
| Desirability of rationing                                 | + 0.30      |                    | - 0.38      |
| Alternative rationing systems                             |             |                    |             |
| First-come, first-served                                  | + .19       |                    | - .19       |
| Lottery                                                   | 0           |                    | + .04       |
| Registration                                              | - .10       |                    | + .12       |
| Merit                                                     | + .03       |                    | + .02       |
| Entrance or use fee                                       | - .10       |                    | + .06       |
| Existing management policies<br>(management policy score) | + .17       |                    | - .29       |

<sup>1</sup>The contingency tables from which the gammas were obtained had five response categories for the "desirability of rationing" and each of the five "alternative rationing systems." The management policy score, solitude orientation, and resource development orientation were each broken into three categories. Tests were not made of the statistical significance of relationships because the full universe, rather than a sample, was surveyed.

Such conclusions rest on a limited data base. The extent to which the findings reviewed here or reported by Lucas can be generalized is not clear; it is our assessment that today's wilderness user supports a more purist perspective about wilderness management than his or her counterpart a decade ago.

A third conclusion we can make is that many studies reveal a tendency for users to support the status quo. Some of this might derive from the legitimate belief that what exists now is fine and any changes will only detract. The belief might also derive from concerns that changes will alter the character of the setting in ways that will attract more users or a different kind of user. The principal implication for managers is that cross-sectional attitude surveys provide only a measure of opinion at one time. Without a context within which to place such data, results are difficult to interpret. Being able to compare the results of one study with those obtained at a different place or time provides a basis for appraising how such results might be interpreted and used.

The expressed preference for the status quo also holds important implications for the manager contemplating change. As we stated earlier, attitudes are not a prescription for management; conditions might dictate that despite a seeming contentedness among present users, new actions must be implemented. In such cases, however, managers need to match implementation of any new action with efforts to inform users of the need and rationale for that action. Attitudes do change in response to information, and managers can play a critical role in this process.

Fourth, on virtually all issues, a diversity of opinion exists. Typically we focus on whether more people support or oppose some issue. However, we believe it is important to review the full spectrum of opinion: the level of support, the level of opposition, and the extent to which a neutral opinion exists. To be neutral is to have an opinion. It might reflect a legitimate view that it really doesn't matter, or it could reflect an equally legitimate view that people simply cannot arrive at an opinion, either because they have not had adequate time to think about it or because they lack adequate information to make a judgment. The neutral category represents an important group in situations where opinion is evenly divided between pro and con; in these situations it might represent a potential "swing vote" in public sentiment. Accurate information about the reason for some action or the implications of some step can be critical in influencing how people might move from a neutral stance.

It is also important to examine the distribution of opinion at the extremes. Strongly held views, either for or against, can be suggestive of likely behavior. When opinion is not just against, but is strongly against some issue, managers have an important indication that the issue is particularly sensitive. Proceeding with the proposed action demands care and planning lest public opposition overwhelm it.

Finally, we have seen how opinion about various management actions differs among user groups according to a variety of factors—their method of travel, relative level of wilderness experience, and intensity of attitudes toward wilderness. All these factors permit a more critical as well

as useful analysis of the data. Users differ in many ways, leading them to appraise management actions in different ways. By grouping users into categories, we are able to segment the user population into subunits possessing more uniform conceptions of wilderness and its use and management. This provides a more useful method of looking at the distribution of opinion about an issue. If there is opposition to the provision of stock facilities, does it all derive from backpackers? If so, and the area provides a significant opportunity for horse use, the management response might be to separate user types. On the other hand, if there is opposition among horse users as well, then perhaps there is serious question as to the need for such facilities at all. Or, efforts to improve the stock handling capabilities of horse users need to be emphasized. In any case, a more refined analysis of the user population helps improve the ability to analyze and evaluate attitude data.

Visitor attitudes are particularly important to management in situations where there is conflict among users or feelings of dissatisfaction about existing conditions. As wilderness visitation has grown, so have perceptions of conflict and concerns for the impacts of this increased use. The following section explores these concerns and the reasons for them.

## CONFLICT AND CROWDING IN WILDERNESS SETTINGS

As the last section has shown, the maintenance of wilderness requires active and diverse management. The fact that people value wilderness and desire to experience it produces a fundamental paradox: that appreciation may threaten the natural qualities that define wilderness environments. It has also raised an even deeper concern over the extent to which use should be regulated. Users are growing in numbers, coming in contact with one another, and experiencing conflict and crowding. If solitude is a fundamental aspect of the wilderness experience, the presence of others invariably impacts that experience.

### The Concept of Carrying Capacity

Many have talked of the need to establish a carrying capacity in wilderness environments. The fundamental concept appears intuitively sound. It has been possible to identify carrying capacities for cattle and deer in wildland situations based on their impact on forage. Thus, it should be possible to recognize when recreational impacts are too great and use needs to be curtailed. Although such logic at first glance appears sound, the attempt to actually determine a carrying capacity is fraught with difficulty. There are many differences between complex humans moving through a wilderness and bovines browsing, though many cynics would not necessarily agree.

In this section we will discuss problems relating to visitor perceptions of conflict and crowding. Discussions of carrying capacity generally include concerns for impacts to the environment as well as the crowding dimension. The environmental impact dimension has been covered in depth in other papers in this collection. Here we focus on visitor reaction to impacts as well as to other recreationists.

There has been a substantial amount of research on the impacts of recreational use and visitor perceptions of crowding. Perhaps the most comprehensive effort to summarize this literature was undertaken by Graefe and others (1984). A related bibliography by Vaske and others (1984) is also available.

There has been much controversy over the establishment of a carrying capacity, and many have argued that the concept is not even a valid notion to apply to recreation (Schreyer 1979; Burch 1981). One of the more universally agreed on facts is that there is no such thing as a carrying capacity for an area. Rather, there are many possible capacities, depending on resource goals, visitor distribution and behavior, and environmental characteristics. Thus, rather than talk of a carrying capacity, it is more appropriate to consider the broader picture of managing for and regulating recreational use. This might require use limitation, but there can be many other ways of dealing with impacts or conflicts.

Graefe and others (1984) presented a model of the dynamics of visitor response to others in terms of two conceptual lines of inquiry. The first was expectancy theory, which assumes that people develop expectations for what they will encounter and then gauge what is actually encountered against those expectations. This is one of the fundamental underpinnings of the motive approaches to understanding visitor behavior described earlier.

Expectations can be general and diffuse, such as the expectation to experience nature. They can also be quite specific. For instance, a person might expect to camp at a specific campsite on a given lake with no other persons there. A person might desire to participate in wilderness recreation to experience solitude. The choice of a particular environment is based on the expectation that few people will be seen. If more people are seen, this can lead to dissatisfaction. Depending on the level of specificity, an expectation might be more or less strongly tied to feelings of dissatisfaction when encounters with others are greater than desired.

Their second line of inquiry was that of norms. Norms are standards for evaluation of behaviors, persons, or situations (Cancian 1975). As norms are invariably socially influenced ways of looking at the world, we view shared norms as "social norms" (Black and Heberlein 1976). People can share norms concerning what the appropriate level of use for an area should be, as well as what should be appropriate behaviors of users and levels of impact to the environment. To the extent these norms are reasonably well-defined among group members, they should be measurable and standards for levels could be established.

Crowding can occur when numbers of others exceed one's expectations. These expectations can be shared in a social context and formalized as norms. Different dynamics can be used to explain these workings. "Discrepancy" models suggest dissatisfaction is a function of the gap between what was expected and what was encountered (Peterson 1974b; Becker 1978; Schreyer and Roggenbuck 1978). "Social interference" models imply that negative outcomes arise when the presence or behavior of others interferes with the individual's attainment of desired goals (Jacob and Schreyer 1980).

"Stimulus overload" models are founded on the notion that problems arise when encounters with others result in greater social interaction than desired (Baumgartner and Gundry 1978; Gramann 1982). All these models agree that it is necessary to understand the experiences and outcomes sought by recreationists to understand their reaction to encounters with others (Graefe and others 1984).

## The Assessment of Crowding

There is tremendous complexity in the human response to the natural environment. Given this complexity, there is a temptation to avoid comprehensive examination of these issues by concluding "everyone is different" and managing for the mythical average visitor or the lowest common denominator of human perception. However, simplifying such complexity does not resolve problems resulting from too many visitors to the wilderness; rather, it demands a more sophisticated understanding of the forces at work in assessing perceptions of crowding.

Human response to others is affected by a variety of background and situational variables. We can easily assess the objective dimensions of human interaction. Increasing use levels in wilderness can be shown to relate to an increasing level of encounters among visitors (Shelby 1976, 1980b; Heberlein and Vaske 1977; McDonald and Hammitt 1979). Increased encounters are generally associated with increased perceptions of crowding (Schreyer and others 1976; Bultena and others 1981b; Womble and Studebaker 1981; Hammitt and others 1982; Graefe and others 1984). However, density is not equivalent to crowding. Density refers to the number of individuals in a given setting, while crowding relates to the negative evaluation of that density. That evaluation is affected by many factors (Altman 1975).

Problems from the presence of others might not result from direct encounters. People can respond more strongly to impacts perceived as being caused by others than actually seeing them (Lee 1975). In many cases, visitors are likely unaware of impacts (Cole and Benedict 1983). Even if the impact is noted, it might not have an adverse effect on the visitor's experience if judged not to be important (Lucas 1979; Graefe and others 1984). Further, visitors might be more sensitive to evidence of humans, such as litter, than to actual impacts to the environment, such as eroded trails (Frissell and Duncan 1965; Stankey 1973). Impacts cannot only result in negative reactions, but can increase perceptions of the use levels of an area (Ditton and others 1983). Vaske and others (1982) found that "environmental disturbance" was the strongest predictor of perceived crowding in a wilderness.

## Crowding, Satisfaction, and the Recreation Experience

A fundamental notion involved in these concerns is the belief that the perception of crowding negatively impacts the wilderness experience. This has usually been studied through an assessment of recreationists' satisfaction with the numbers of others encountered. Because the concept of recreation resource management is founded on the notion of providing opportunities for visitors to attain

satisfaction, this appeared to be the most direct method of analyzing crowding.

Unfortunately, the situation has not been as straightforward as originally assumed. In many cases, use levels have not been related directly to satisfaction. Graefe and others (1984) summarized 36 studies measuring different dimensions of encounters and satisfaction. Of those studies measuring the correlation between actual density of an area and visitor satisfaction, only two showed a significant statistical effect, and both of those were positively correlated (Heberlein and Laybourne 1978; Heberlein and others 1982). Both involved studies of hunters in which the presence of others was seen as advantageous in driving the deer toward them.

In studies measuring the relationship between reported contacts and satisfaction, three were significant, but again two were in the positive direction (Hammitt and others 1984; Vaske and others 1983). Graefe and others (1984) did find a more consistent relationship between both actual density and reported contacts and perceptions of crowding. Further, there were consistent relationships between perceived crowding and level of satisfaction (Shelby 1976; Heberlein and Vaske 1977; Shelby and Colvin 1979; Ditton and others 1982; Vaske and others 1982, 1983).

Many of the studies reviewed by Graefe and others (1984) did not involve use in wilderness settings. Both conventional wisdom that assumes wilderness as a setting where there is little if any contact with others and research supporting visitor preference for low levels of interparty contact lead one to hypothesize that crowding in wilderness could be a problem.

Research by Stankey (1973, 1980) indicated a strong preference among wilderness visitors for low levels of interparty contact. Although responses to questions about the impact of rising use levels on satisfaction were based on hypothetical situations rather than actual use conditions encountered, the results pointed to the likelihood that visitor satisfaction declined as contact levels rose.

Lucas (1980, 1985) found evidence supporting this hypothesized relationship. The relationship between visitor satisfaction and level of use encountered, measured three different ways, was negative, although the strength of this relationship declined over the decade between the two studies.

**Desired Outcomes.**—The numbers of others encountered is not the sole consideration in determining satisfaction in a recreation experience. Schreyer and Roggenbuck (1978) showed that perceptions of crowding are linked to the strength of crowding-sensitive outcomes, such as stress release and solitude. However, if such outcomes are not important, the presence of others need not be disturbing (Stankey and McCool 1984). Recreational engagements are entered precisely because we want them to be satisfying. Thus, even if we would have preferred to see fewer people, we might be unwilling to let certain negative aspects such as this impact that satisfaction (Heberlein and Shelby 1977).

Schreyer (1979) suggested that people might use any number of coping mechanisms, such as emphasizing more crowding-independent outcomes and altering perceptions of the numbers of people actually present to avoid negative outcomes (Schmidt and Keating 1979; Gramann 1982).

Further, people might have few strictly defined expectations about numbers of others they might encounter (Cheek and Burch 1976).

**Behavior Change.**—People can change their behavior patterns in response to crowding. Thus, although numbers might be high, those most sensitive to such conditions avoid situations of high density. Such behavior shifts are referred to as displacement. The extent to which displacement occurs is arguable. In a study of river floaters in the Grand Canyon, Nielsen and Endo (1977) found that, although some boaters moved to lower density rivers, others moved to higher density ones. Anderson (1980) documented displacement among visitors to the Boundary Waters Canoe Area. Although displacement was noted, she found no differences among persons based on amount of experience. Other studies have shown some displacement among visitors from more crowded to less crowded environments for a variety of water-based activities (Heberlein and Vaske 1977; Nielsen and Shelby 1977; Vaske and others 1980; Becker 1981a).

**Conflict vs. Crowding.**—People might respond not merely to numbers, but rather to the behavior of others (Stankey 1972). Conflict can make people more sensitive to the numbers of others, and thus make an area seem more crowded. Jacob and Schreyer (1980) define conflict as “goal interference attributed to another.” They suggest that conflict occurs when others frustrate a person’s desired outcomes for an experience, or when they violate norms of appropriate behavior as defined by those persons. Such norms could relate to the activity, or they could be defined as appropriate behaviors for the recreation place. Some conflicts are fueled by the perception that others possess a different lifestyle with ways of behaving and values threatening to those experiencing conflict. This is a strong force leading to conflict among different “types” of recreationists, such as hikers and horseback riders.

**User Types.**—Graefe and others (1984) pointed out that different types of users differ in their sensitivity to others. This again is likely due to their seeking different outcomes and having different norms about appropriate encounter levels. It is difficult to generalize perceived crowding of visitors to an area because they might differ widely in perceptions of the same encounter levels. Because different types of users perceive crowding in different ways, making decisions about crowding inherently implies a judgment favoring one type of user over another (Schreyer 1976).

Confrontation and conflict often underlie crowding perceptions. Graefe and others (1984) presented a tabular representation of a number of studies comparing crowding perceptions of different types of visitors. They dichotomized the types as “sensitive” or “tolerant” to the presence or behavior of others. Among these sensitive/tolerant types are several found in wilderness: nonmotorized/motorized water-based recreationists (Adelman and others 1982), fishermen/other water-based recreationists (Driver and Bassett 1975; Gramann and Burdge 1981; West 1982b), frequent/infrequent participants (Graefe 1981), experienced/inexperienced visitors (Nielsen and others 1977; Schreyer and Nielson 1978; Vaske and others 1980; Ditton and others 1982; Hammitt and others 1984), high status/

low status participants (West 1982a), and solitude seekers/thrill seekers (Absher and Lee 1981).

**Group Dynamics.**—Many differences noted above enhance the notion that crowding and conflict perceptions are asymmetrical; that is, one group can experience conflict while another does not. Other elements of group dynamics can affect crowding perceptions. For instance, people might be particularly sensitive to encountering large groups (Lime 1972). They might prefer to see many smaller groups in a wilderness setting than one very large group, even though they might see the same number of people (Stankey 1973; Pfister and Frenkel 1974).

Individuals highly committed to an activity can have a more strongly defined sense of appropriate behavior. This is reinforced in group settings to intensify perceptions of conflict with others' behavior (Driver and Bassett 1975; Gramann and Burdge 1981; West 1982b). Individuals can reinforce their own sense of commitment and belonging to a given social group by acting out perceptions of conflict of others. Thus, the group might not only define norms of behavior, but might channel the perceptions of participants toward the conflict, thereby catalyzing more negative feelings than would otherwise be there. The extreme expression of this dynamic is "mob effect."

**Situational Factors.**—Graefe and others (1984) noted that many factors influencing perceptions of crowding depend on where those perceptions occur and under what circumstances. For instance, people tend to be less sensitive to seeing others at the border of a wilderness than in the interior. In particular, the sensitivity to crowding appears to be heightened at the campsite. Stankey's studies report strong visitor preference for campsites screened from the sights and sounds of others (Burch and Wenger 1967; Stankey 1973). Lucas (1985) found a fairly strong association between visitor satisfaction and success in finding desired campsite solitude; eight out of 10 respondents preferred no other persons camped within sight or sound and about two-thirds reported they were able to find such conditions consistently. Heberlein and Dunwiddie (1979), in observing wilderness campsite selection in a portion of Wyoming's Bridger Wilderness, reported that experienced visitors were more likely to select sites farther from others and to select sites in zones containing the fewest other occupied sites. Further, the length of time that others are encountered might affect the sense of crowding (Titre and Mills 1982).

Designation of the area can have an effect. Shelby (1981a) suggested that persons in designated wilderness tend to be more sensitive to crowding than persons using undesignated but undeveloped recreation areas. This is likely due to the acceptance of definitions of the norms attributed to a certain recreation place (Lee 1972). It could also be a function of the tendency to assume that a designated area is of "higher quality," leading to higher expectations (Anderson 1980).

The person's relationship with the environment can also be a factor. If the individual has seen the environment change over time, with increasing numbers and diversity of use, this can result in a greater sensitivity to the presence of others (Driver and Bassett 1975; Vaske 1978). This is particularly the case if the person values the place

highly and has a strong attachment to it (Jacob and Schreyer 1980).

In summary, numerous studies have focused on conflict and crowding in wilderness settings. Given the legislative mandate defining solitude as a key attribute of wilderness, this is not surprising. The research reveals considerable visitor concern with problems related to crowding and associated impacts.

Some reasonably well-agreed-on conceptions of appropriate interparty contact levels in wilderness settings are found in the literature. Most visitors prefer that daily contact levels not exceed two or three other parties. There appears to be even more consensus about appropriate use levels at campsites; there is a decided preference for no others camped within sight or sound. The argument has been made, in fact, that the ability of a wilderness to provide campsites that offer visitors this level of isolation might represent a "bottleneck" on the area's overall capacity (Stankey 1973).

The asymmetry in felt conflict between groups is also a consistent finding. The most obvious manifestation of this conflict is between groups using different methods of travel, such as hikers and horseback riders or canoeists and motorboaters. Persons traveling on foot or by paddling are highly sensitive to, and distressed by, contacts with persons traveling by other means, while this latter group shows less concern about the former. There appear to be some strong norms of appropriate behavior involved in this situation, ascribed to by the one group but not the other. The conflicts generated by these norms appear to be more critical than those brought about by encountering higher-than-preferred use levels.

The relationship between visitor satisfaction and encounter levels is complex. Following earlier work by Stankey (1973) that hypothesized declining satisfaction levels with rising levels of contact, empirical investigations of this relationship reported either no effect or, in many cases, an effect opposite to that hypothesized; that is, as use rose, so did satisfaction. Many of these studies, however, were conducted in nonwilderness settings where motives and expectations were not focused on outcomes related to solitude. Even in some wild river settings, characteristics of users (such as a large proportion of first-time visitors with ill-defined expectations about use) or situational characteristics (the excitement and thrill of running rapids, the noise of thundering water) likely diminish the significance of interparty contacts, further contributing to the conclusion that use levels have little effect on visitor satisfaction levels.

Increasingly, however, analyses have grown more sophisticated. Part of the explanation lies in recognizing the importance of different outcomes to visitors; for those to whom solitude is unimportant, rising contact probably has little significance. Conversely, for those who value solitude greatly, the presence of others can be a critical source of dissatisfaction. Moreover, we have come to understand that recreationists are able to employ a wide range of strategies to cope with situations they encounter so that they can continue to define their trip and experience in positive terms. Our understanding of the complexity of the concept of satisfaction continues to grow; the

lack of a statistical association between use level and satisfaction might reflect more the crude state of our ability to measure satisfaction than anything else.

Measures of the preferred types and levels of interparty encounters are useful information for managers concerned with establishing estimates of appropriate use. They reflect the kind of conditions visitors seek and, as such, provide managers with a basis for establishing objectives related to visitor experiences. The difficulty in measuring visitor satisfaction associated with different use levels should not be taken as an indication that the level and type of use visitors meet while in wilderness is not a matter of great concern to many of them.

## SOME CONCLUDING REMARKS

As we review the studies covered in this paper, three broad conclusions can be made. First, there has been an evolution from a situational descriptive approach to the study of attitudes and behavior to one founded much more rigorously in theory. Many early investigations, although tied to general notions of perception or other organizing framework, lacked clear, explicit theoretical underpinnings (Stankey 1982). More recently, the theoretical rigor of investigations has increased significantly.

Second, over the period covered by this review, more sophisticated analytical procedures have been employed, moving from straightforward descriptive accounts, including frequency distributions and cross tabulations, to multivariate analyses, including a variety of cluster analytic techniques. As a result, the power and complexity of analyses have increased.

Finally, we see an increasing interest in examining attitudes and behavior within a social, as opposed to a psychological, context. Recreation behavior is a social behavior; it takes place typically within a group structure, and groups play a special role in motivating, sustaining, and giving meaning to such behavior. However, group influence on recreation behavior has only recently received the attention it warrants. It is our judgment that such a focus will provide added strength and meaning to efforts to understand recreation behavior.

Information about wilderness recreationists' attitudes and behavior is increasingly viewed as important to the planning and management process. There is growing recognition that experiences produced in wilderness settings are of parallel importance to the preservation of the ecological processes that characterize and shape such areas. If any single conclusion can be drawn from the substantial body of literature that we have reviewed, it is that people, users and nonusers alike, place a very high value on wilderness and are concerned with its future. Although many lack a technical understanding of wilderness management and might not possess a clear understanding of the subtleties, implications, and consequences of the various actions they may undertake, no one should underestimate the interest and concern they hold.

As we have suggested in several places, a major implication for managers is the need to provide this highly motivated clientele with accurate information from which they can make informed input. In many instances, it is clear that people do not possess the level of information they

desire or need to make such input, but it is just as clear that they desire a role in the decision process and that the views they hold about management are of increasing importance in making those decisions.

Here is where research has an important role and obligation. If policy decisions about the management of wilderness are going to be made with public input as one critical element, those making such decisions have to be assured that the base of information about that public input is sound and reliable. Managers have as much reason to be concerned with the concepts of validity and reliability as scientists. There is often a point of conflict between the researcher and the manager on this matter. The manager sees the research worker's concern with the trappings of science—sample design, tests of significance, and so on—as clutter that holds up the delivery of the answer. The researcher, on the other hand, views the demands of the managers as another contaminant to be dealt with in the conduct of good science. The end result is often dissatisfaction on the part of both parties.

But as Shelby (1981b) has noted, both parties have important obligations in the process of integrating research findings into the management process. Chief among these obligations are the need to maintain an interactive environment where concerns can be expressed, to carefully define how research findings can and will be used, and to recognize that the development of a good information base from which sound decisions can be made requires time, money, and effort. We might also add that research findings, by themselves, seldom provide straightforward answers to the questions that face managers (Stankey 1979a). Such findings do, however, provide information that bears on these questions. It is in the interaction and dialogue that must accompany such applied research that both the limitations and opportunities inherent in the data can be drawn out.

As we look to the future and the needs for further research on attitudes and behavior, several issues seem apparent, some methodological, some substantive. Certainly one major area requiring attention is the need for longitudinal research designs that provide a sound basis for trend analysis. Such analyses could help identify major changes in client groups, tastes, and preferences that would serve as critical input into the revisions of management planning documents as well as provide important insight into how the image and meaning of wilderness are changing over time.

It is important that more work look at the role and meaning of wilderness in contemporary society, a perspective that extends beyond that held by the user. Users are only temporary tenants in the wilderness; however, such areas remain the property of society forever. The historical analysis pointed to the tremendous shift in societal attitude toward wilderness that has occurred in the past century; our review of attitudes toward management suggested some large changes have occurred in just the past 20 years. There seems little reason to presume this cultural evolution will not continue. We need to consider ways to monitor systematically such society-wide changes in perception.

We see a need for continuing work directed toward development of better ways to promote sensitive manage-

ment systems in wilderness, techniques that ensure protection of the wilderness experience at the same time they ensure adequate protection of fragile wilderness ecosystems. Influences on behavior that correct depreciative acts in subtle yet effective ways need to be ascertained. We are particularly concerned with how information can better serve the needs of both manager and user.

It is clear that relatively well-defined rules of appropriate conduct do emerge—norms that provide a framework of appropriate behavior. How do these norms develop; how are they communicated, internalized, and reinforced; and what forces lead them to change? To what extent can managers utilize such internalized forms of behavior control to achieve area objectives? In particular, are there ways in which such norms can be utilized as the basis of standards designed to ensure maintenance of wilderness quality?

We see a need to obtain a better grasp of how wilderness recreationists make decisions and what factors influence those decisions. What role, for example, does information about social and site attributes play in the decision process? What are the key attributes of wilderness settings that influence visitor selection of sites and their subsequent satisfaction? What group influences operate to shape individual decisions? How are the images that people hold of wilderness formed, how do those images affect their decisions about the use of such areas, and to what extent can those images be altered in a manner compatible with wilderness preservation while respecting the individual's freedom of choice?

Studies of wilderness visitors reveal their great adaptability to changing conditions and their capacity to achieve satisfactory experiences in response to these changes. Yet, just as clearly, visitors hold well-defined preferences for certain conditions, such as levels of encounters with others. There is a need to better understand this adaptive process and to clarify the relationship between preferred states and those considered tolerable. This range of acceptability could serve a particularly useful purpose in prescribing management guidelines.

Science often seems concerned with being innovative, but there are strong reasons to encourage replicative research projects involving repetitions both in time and over space. The trend study by Lucas (1985) provides a unique opportunity to look at the changes occurring in one area over the span of a decade; such studies done elsewhere would be similarly beneficial. Many of the studies of attitudes and behavior, like many ecological studies, have been conducted in the Western United States. There is a need to replicate these studies elsewhere to determine the extent to which the patterns involved are universal and shared or unique and idiosyncratic. There is particularly a need for improved consistency in such replicative research and to search for patterns of generalization, especially in motive clustering and site attribute preference research.

The continuing issue of how well attitudes predict behavior remains with us. Many of the behaviors with which we are concerned and the behavioral influences involved are difficult to measure. Surveys of attitudes and other dispositions such as preferences and expectations are relatively more easily conducted. But if such measures have weak reliability in predicting behavior, there might

be little reason to conduct them. Improved models of the behavior-attitude linkage are needed.

We have noted the generally atheoretic nature of much of the previous wilderness research. There remains a continuing need for theory building and testing. Yet it is important to recognize that it is unlikely there is any single theory most appropriate for the study of wilderness attitudes and behavior or, indeed, that there is any theoretical perspective applicable to wilderness as such. The study of the recreational use of wilderness could be undertaken at a variety of differing levels of analysis, ranging from general human behavior, leisure behavior, outdoor recreation behavior, resource-based recreation behavior, to wilderness recreation behavior. The appropriate and most useful theoretical orientation likely changes as one moves from one level of analysis to another. What, if any, is the most appropriate level of analysis?

Since European settlement of North America, America's attitudes toward, and behavior with regard to, wilderness have undergone many changes, from hostility and exploitation to wonder and enjoyment. Now as the period of major expansion of the National Wilderness Preservation System begins to reach its latter stages, it is more important than ever that we better understand our Nation's attitudes and behavior so that we might better learn to preserve these treasured areas.

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