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Diversity in Outdoor Recreation: Planning and Managing a Spectrum of Visitor Opportunities in and among Parks

Diversity in Outdoor Recreation

Outdoor recreation emerged as a scientific field of study in the 1960s, and over the last four decades, numerous studies of park and wilderness visitors have been conducted. While the objectives, scope, and methods of these studies are highly variable, at least one general finding has been pervasive: outdoor recreation is diverse. This is a recurring theme whether in regard to recreation activities, socioeconomic and cultural characteristics of visitors, attitudes about policy, preferences for services and facilities, sensitivity to crowding and conflict, experience level, and motivations for and benefits received from recreation participation. Diversity in tastes for outdoor recreation is found equally in studies of developed campgrounds and investigations of wilderness hikers. For example, an early study of users of vehicle-access campgrounds concluded that study data “illustrate the characteristic heterogeneity of camping as a recreation activity and the multitude of reasons people may have for camping. Diversity in the kinds of facilities provided is an important consideration in recreation planning” (King 1966, 2). A study of wilderness hikers concludes similarly: “Wilderness visitors are not in any sense a uniform or homogeneous population.... Represented among wilderness visitors are value systems that cover a wide and often conflicting range” (Stankey 1972, 92).

Research points out that not only are there differences in taste among people, but that people’s tastes change over time as well. A study in the Pacific Northwest found that the type of camping chosen (wilderness camping, automobile camping, or some combination of the two) was strongly related to changes in the

stage of the family life cycle (Burch 1966). A nationwide panel study of campers found similar relationships between camping activity and the family life cycle (LaPage 1973; LaPage and Ragain 1974). Based on these relationships, it has been suggested that “the forest camping system is like an omnibus—the seats are

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often full but often occupied by different persons as they adjust to the flow of time” (Burch 1966).

Diversity also is evident when the “averaging issue” in outdoor recreation is recognized. An early, important report on outdoor recreation was pointedly titled, *The Average Camper Who Doesn't Exist* (Shafer 1969). The potential problem of relying too heavily on averages has been illustrated as it might apply to camping (Wagar 1963; Wagar 1966; Lime 1974). Studies show that some campers prefer very elaborate facilities for comfort and convenience, while others prefer relatively simple facilities. Moreover, there is a wide range of opinion between these extremes. Providing a single, uniform type of camping opportunity—near the midpoint of the range based on averages, indeed at *any* point along the range—will leave many campers, quite possibly even the majority, less than fully satisfied. However, by offering a range of possibilities, more campers' preferences can be met.

This line of reasoning has been used to develop a definition of quality in outdoor recreation based on diversity (Wagar 1966; Manning 1998). The difficulty in distinguishing between the quality and type of recreation opportunities has been a persistent problem for both visitors and park managers. It is common to be quite subjective when associating certain types of recreation opportunities with high quality. Those

whose recreation tastes are oriented toward the remote and primitive, for example, may consider wilderness recreation to be of high quality and vehicle-access campgrounds as something less. But high quality can and should be found among all types of recreation opportunities. From the perspective of the individual, quality is most appropriately defined as the degree to which a recreation opportunity meets one's needs. From a broader, societal perspective, quality in outdoor recreation can be equated with provision of a diverse spectrum of recreation opportunities.

Diversity in outdoor recreation also has been rationalized in economic terms using an example of a hypothetical undeveloped recreation area (Wagar 1974). If the area were to be used for wilderness recreation, it might support 3,000 visitor-days of recreation each year. If intensively developed, it might support 300,000 visitor-days of recreation. But the decision between these two alternatives should take into account the issue of scarcity. If developed recreation opportunities are relatively plentiful and wilderness recreation scarce, society may place more value on creating additional wilderness recreation opportunities even though they will accommodate fewer visitor-days. This is in keeping with the economic theory of marginal utility: the more we have of some good or service, the less value or importance is placed on each additional unit.

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This economic rationale has been borne out in an empirical test of Colorado deer hunting that explored public willingness to pay for selected types of hunting opportunities (Miller et al. 1977). The value of deer hunting was found to vary among types of hunting opportunities and types of hunting groups. From this, it was demonstrated that total satisfaction of hunters (as measured by willingness to pay) could be increased by providing a spectrum of hunting opportunities.

Diversity also has been rationalized in political terms (Burch 1974). It can be argued that without broad political support, parks and outdoor recreation areas are not likely to be maintained by society at large, and that this support is not likely to be forthcoming if outdoor recreation areas do not serve the needs of a broad spectrum of the population. Therefore, park managers should strive to serve this diversity and not necessarily adhere too closely to the preferences or tastes of any one group or type of visitor.

Conceptual Frameworks for Providing Diversity in Outdoor Recreation

A number of reports in the outdoor recreation literature have emphasized that a systematic approach to outdoor recreation management is needed if diversity is to be designed appropriately. It would be difficult for a single park or recreation area,

regardless of size, to provide a full spectrum of recreation opportunities. Examining each park or recreation area in isolation may lead to management decisions favoring the majority or plurality of potential visitors. While justified in many cases, this process will ultimately result in an entire system of park and recreation areas designed for the average visitor while neglecting a desirable element of diversity. Instead, each park or recreation area should be evaluated as part of a larger system of areas, each contributing as best it can to serve the diverse needs of the public. In this way, low density and other minority recreation opportunities can be justified. It has been suggested that this systematic approach be applied on a broad, regional basis; this way management can best ensure "a diverse resource base capable of providing a variety of satisfactions" (Stankey 1974).

Recognition of the need for diversity has led to a number of suggested classification or zoning systems for recreation areas. Very early precursors to recreation opportunity classification systems suggested that different types of forests be planned and managed to meet the needs of alternative recreation activities (Marshall 1933; Marshall 1938), and that recreation opportunities should range "from the flowerpot at the window to the wilderness" (Wagar 1951). One of the earliest, more formal suggestions was contained in a handbook

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on wildland planning which suggested seven zones ranging from “wilderness” to “semi-suburban” (Carhart 1961). Just a year later, the Outdoor Recreation Resources Review Commission included among its major recommendations a proposal for a six-fold classification system for recreation areas, ranging from high-density use to extensive primitive areas, to be applied to all federal recreation lands (ORRRC 1962).

More recently, two conceptual frameworks—the recreation opportunity spectrum (ROS) and carrying capacity—have emerged in the outdoor recreation literature that help guide design and implementation of a diversity of outdoor recreation opportunities. In the broadest sense, ROS is a conceptual framework for thinking about recreation opportunities (Driver et al. 1987; Driver and Brown 1978; Clark and Stankey 1979; Brown et al. 1978; Brown et al. 1979). It explicitly recognizes that experiences derived from recreation are related to the settings in which they occur, and that settings in turn are a function of environmental, social, and managerial attributes (e.g., degree of environmental impacts, visitor-use levels, and regulation of visitor behavior). By describing ranges and alternative combinations of these attributes, ROS illustrates the potential diversity of recreation opportunities.

Similarly, contemporary ap-

proaches to carrying capacity also emphasize the desirability of a diverse array of recreation opportunities, both within and among parks and related areas. Carrying capacity frameworks such as limits of acceptable change (LAC) (Stankey et al. 1985) and visitor experience and resource protection (VERP) (National Park Service 1997), suggest that recreation opportunities should be defined through formulation of indicators and standards of quality for the resource, social and managerial components of recreation experiences. Moreover, such recreation opportunities should comprise a broad range of experiences at both the park and regional levels. For example, LAC suggests use of ROS in planning recreation opportunities within wilderness and related areas, and also suggests a regional analysis of the supply and demand for alternative types of recreation opportunities. Similarly, VERP advocates analysis of a range of visitor experience and resource conditions, and recommends that such an analysis include a strong regional component by noting that “a range of recreational opportunities in a region is desirable to satisfy the diversity of recreation tastes (National Park Service 1997, 49).

Empirical Approaches to Planning and Managing Diversity in Outdoor Recreation

It is clear from the proceeding sections of this paper that a diversity

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of recreation opportunities is a desirable element of a system of park and recreation areas. But how can such a system of recreation opportunities be designed empirically? This section of the paper presents a series of studies conducted at both the park and regional levels that illustrate how empirical data might be used to help guide planning and management of a spectrum of visitor opportunities at park and recreation areas.

Hiking on the Colorado Plateau.

In the early 1990s, an initial application of the VERP framework was conducted at Arches National Park, Utah (Hof et al. 1994; National Park Service 1995; Manning et al. 1995; Manning, Lime, and Hof 1996; Manning et al. 1996). This work was supported by a program of natural and social science research designed to help formulate indicators and standards of quality (Manning et al. 1993; Lime et al. 1994; Belnap 1998). Initial social science research found that visitors were sensitive to the number of other people using the park, including the number of people encountered along trails and at attraction sites. Thus, the number of people at one time (PAOT) seen along trails and at attraction sites was adopted as an indicator of the quality of the visitor experience. A second phase of research focused on setting standards of quality. Several series of photographs were developed using photo-editing computer software to show a range of visitor-use levels at

selected trails and attractions throughout the park. Four representative photographs from the two series of 16 photographs used at Delicate Arch and North Window are shown in Figures 1 and 2. Representative samples of visitors were asked to judge the acceptability of these series of photographs. Study findings indicate that maximum acceptable levels of crowding vary among study sites. For example, the point at which aggregate visitor judgments of crowding become “unacceptable” is approximately 20 PAOT for North Window and is approximately 30 PAOT for Delicate Arch. These and related data provided an empirical basis for formulating alternative standards of quality and an associated array of recreation opportunities within the park.

More recent studies have begun to expand this research to other parks in the Colorado Plateau region (Lime et al. 2001). For example, representative samples of hikers to four Colorado Plateau parks—Arches National Park, Capitol Reef National Park, Colorado National Monument, and Natural Bridges National Monument—were asked to judge the acceptability of a series of 16 photographs showing a range of visitor use levels along a 100-meter section of trail representative of the high desert environment of the Colorado Plateau. Representative examples of these photographs are shown in Figure 3.

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Figure 1. Sample photographs of a range of visitor-use levels (PAOT) at Delicate Arch.



Figure 2. Sample photographs of a range of visitor-use levels (PAOT) at North Window.

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Figure 3. Sample photographs of a range of visitor-use levels (PAOT) along a generic section of trail.

Study findings, as shown in Figure 4, suggest that visitors to all four park areas judge the acceptability of the photographs in a similar way. However, rather than manage all four parks at a similar crowding-related standard of quality (for example, in the range of 8 to 12 PAOT, the point at which aggregate visitor judgments of crowding cross the line from the acceptable into the unacceptable range), hiking standards in each park might be based on resource sensitivity, accessibility, or simply the management objective of providing a diverse set of recreation opportunities within a region. The data graphed in Figure 4 begin to provide an empirical basis for such decisions. For ex-

ample, PAOT-related standards of quality for the study parks might be set at any point in the “acceptable” range of the curves shown in Figure 4 (i.e., at any point between 0 and 8-12 PAOT).

Further studies have begun to refine this type of research (Lime et al. 2001). For example, representative samples of visitors to the four park areas noted above were asked to examine the series of 16 photographs of trail use described above and select the one that represented the maximum acceptable level of use. However, this series of questions incorporated four dimensions of “acceptability” (Manning et al. 1999). The first question asked: “Which photo-

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graph looks most like the number of people you would *prefer* to see at any

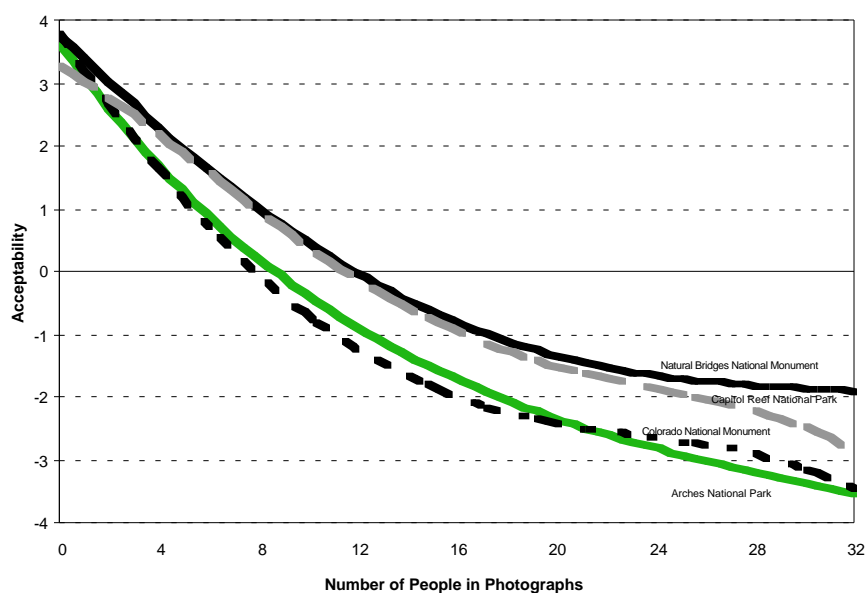


Figure 4. Visitor acceptability ratings of photographs of a range of visitor-use levels (PAOT) along a generic section of trail.

one time along this section of the trail?” (This dimension is called “preference.”) The second question asked: “Which photograph looks most like the highest number of people that you think is *acceptable* to see at any one time along this section of the trail?” (This dimension is called “acceptability.”) The third question asked: “Which photograph looks most like the highest number of people at any one time along this section of the trail that is *so unacceptable* that you would *end your hike sooner than planned?*” (This dimension is called “tolerance.”) The fourth question

asked: “Which photograph looks most like the highest number of people at one time that the National Park Service *should allow* along this section of trail?” (This dimension is called “management action.”)

Study findings are shown in Table 1, and once again suggest there is considerable similarity and consistency among visitor judgments of all four dimensions of acceptability across the four study parks. These data help provide an empirical foundation for formulating an array of crowding-related standards of quality and an associated spectrum of rec-

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recreation opportunities. Hiking in one or more parks, for example, could be managed for high levels of solitude (i.e., the “preference” dimension of acceptability) while other parks might provide hiking opportunities that are lower in solitude, but accommodate relatively large numbers of visitors (i.e., the “management action” or even “tolerance” dimensions of acceptability). In this way, a diverse spectrum of outdoor recreation opportunities might be provided within and among a regional system of parks.

Boating on the Colorado and Green Rivers. Recent research at Canyonlands National Park explored use and users of the Colorado and Green rivers system, including the four dimensions of acceptability (described in the previous section) towards seeing other watercraft (Warzecha et al. 1998). The Green River, which flows southward to merge with the Colorado River deep within the park, is a flatwater stretch that was found to be popular with canoeists and kayakers. The flatwater stretch of the Colorado River, north

of the confluence with the Green River, and Cataract Canyon, the whitewater stretch of the Colorado River below the confluence, were found to receive more commercial use (guided trips) and more motorized use than the Green River.

As an alternative to judging the acceptability of a series of photographs, representative samples of river users were asked to answer a set of questions addressing the four dimensions of acceptability toward seeing other watercraft: “About how many watercraft would you have *preferred* to see *today*?” (“preference”), “What do you think is the *maximum number* of watercraft that would have been *acceptable* to see *today*?” (“acceptability”), “What do you think is the *maximum number* of watercraft the National Park Service *should have managed* for you to see *today*?” (“management action”), and “What do you think is the *maximum number* of watercraft that you could see *today* before you would *consider not visiting* this river again?” (“tolerance”). On each day of their trip, using a diary format, river users were

Park	Dimensions of Acceptability			
	Preference	Acceptability	Management Action	Tolerance
Arches	5.5	13.2	23.3	18.2
Capitol Reef	8.2	11.8	13.7	23.2
Colorado NM	2.9	9.7	13.6	24.0
Natural Bridges	9.6	11.8	16.4	22.5

Table 1. Crowding-related standards of quality (maximum POAT along trails) using four “dimensions” of acceptability.

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asked to record a number of watercraft for each of the four questions as these questions applied to the specific stretch of river they had floated that day.

Study findings, shown in Table 2, indicate variations in acceptability for seeing other watercraft based on the stretch of the river system respondents were traveling. The data from river users provide support for developing a spectrum of recreation opportunities congruent with the resource and its users. For example, the maximum numbers of watercraft reported by Green River users, along with the physical characteristics of the river, suggest the potential appropriateness of managing that stretch for flatwater, nonmotorized, low-density recreation opportunities. In contrast, the maximum numbers of watercraft reported by river runners in Cataract Canyon suggest the appropriateness of that river stretch for whitewater, relatively high-density opportunities that provide an element of "safety in numbers" for a variety of watercraft types. This type

of research could be extended beyond park boundaries to complement larger-scale regional planning and management efforts for the Colorado and Green rivers system.

Conclusion

Diversity is a desirable element of a system of park and recreation opportunities. Moreover, several conceptual frameworks have been developed in the scientific literature, including ROS and carrying capacity, to help encourage and guide efforts to plan and manage parks and related areas for diverse recreation opportunities. However, it is not feasible for any one park to provide a full spectrum of recreation opportunities. This suggests that efforts to meet the needs of a broad range of park visitors will require a regional approach to recreation planning and management that spans parks and even systems of parks and related areas.

Initial research on hiking and boating in parks within the ColoradoPlateau suggests that empirical data can be developed to support a

River stretch	Dimensions of Acceptability			
	Preference	Acceptability	Management Action	Tolerance
Green River flatwater	2.0	7.5	8.4	14.7
Colorado River flatwater	3.2	9.6	10.2	19.4
Cataract Canyon	3.6	11.1	11.5	24.1

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Table 2. Crowding-related standards of quality (maximum number of watercraft) for a regional river system using four "dimensions" of acceptability.

regional approach to park and recreation management. At the park level, study findings helped planners and managers at Arches National Park design alternative recreation opportunities at major hiking-related attractions (National Park Service 1995). An extension of this research provides an empirical foundation for designing a broad spectrum of hiking opportunities across several National Park Service areas within the Colorado Plateau. Similar research is contributing to a new river management plan for Canyonlands National Park that specifies three distinct types of boating opportunities on the Colorado and Green rivers system.

The research described in this paper is clearly preliminary, and needs to be expanded to other elements of park and recreation experiences and other parks and geographic regions, and might be augmented by other research approaches. For example, the data described in this paper apply only to crowding-related issues. Both ROS and carrying capacity explicitly recognize that recreation opportunities are defined by a variety of resource, social, and managerial attributes. Empirical research should be ex-

panded to address a broader range of these attributes. Moreover, the studies outlined in this paper are limited to a few areas managed by the National Park Service within only one geographic area. Clearly, this research needs to be extended geographically by incorporating more parks, other geographic "clusters" of parks, and perhaps even regions administered by multiple park and recreation-related agencies. The recent administrative evolution of the National Park System into geographically-linked "clusters" of parks, along with the multi-agency nature of the evolving system of Cooperative Ecosystems Studies Units (CESUs), suggests enhanced feasibility for regional approaches to the research, planning, and management needed to design and maintain a diversity of visitor opportunities in and among parks.

Finally, analysis of regional supply of and demand for selected types of park and outdoor recreation opportunities, as suggested by McCool and Cole in a companion paper in this volume, would augment the usefulness of the type of data illustrated in this paper.

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