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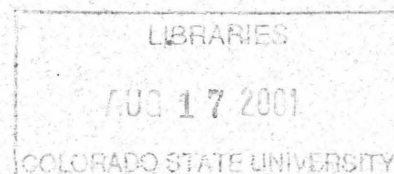


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**THE USES OF EXISTING INFORMATION IN THE PROCESS OF
SETTING SOCIAL STANDARDS FOR PROPOSED WILDERNESS
AREAS OF ZION NATIONAL PARK**

MARK E. VANDE KAMP

Technical Report NPS/CCSOUW/NRTR-98-07
NPS D-127



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PREFACE

This document follows from a preliminary report titled *How Can We Best Use Existing Information To Set Social Carrying Capacity Standards In The Wilderness Areas Of Zion National Park?* The preliminary report described the results of interviews with six researchers who are experts in the area of social standards. These interviews were intended to determine whether the effort that might be put into this document was justified, and to gather information that would guide and focus such an effort so as to help ensure that it would provide information useful in the Zion planning effort. In the interviews, each researcher imagined that he or she had been asked to set standards for Zion's proposed Wilderness and then suggested strategies that should prove most useful in reviewing existing information. Based on these interviews the report concluded by discussing three topics: 1) a proposed strategy for conducting the review; 2) a discussion of what the review might be expected to accomplish; and 3) a justification for why the review should be conducted.

Unsurprisingly, the specifics of this document were not predicted exactly by the plans of the preliminary report. The shifts from the original review strategy reflect judgments based on an increasing appreciation of the issues relevant to social standards in Wilderness that developed throughout the review process. The changes were not dramatic, consisting primarily of shifts in emphasis rather than alterations in the basic plan. Nonetheless, they are important and are likely to be evident to readers of both documents.

The best illustration of the general shift in emphasis from the preliminary report to this document is found in the comparison of their titles. The preliminary report asks how we can *use existing information to set social carrying capacity standards* while this document describes the

use of existing information in the process of setting social standards. The language of the first title suggests that existing information will define social carrying capacity while that in the second title implies that it will play a role in the process of setting social standards. This shift from *definition to information* reflects a leap in appreciation for the broad range of complex issues that are relevant when setting social standards. This document is intended to aid the process of setting social standards at Zion, first by presenting an evaluation of the literature aimed at measuring Wilderness visitors' attitudes concerning both acceptable numbers of encounters with other visitors and acceptable numbers of other parties camped within sight or sound of selected campsites, and second by presenting a discussion of the process of setting standards that includes insights from the experiences of managers and researchers. Although the first goal was originally the primary impetus for this review, the treatment of the second goal is likely to be the more substantial contribution to the Zion planning process.

STRATEGIES FOR READING THIS DOCUMENT

The nature and structure of this document make an executive summary redundant and potentially misleading. Readers who would normally turn to the executive summary can gain a comparable view of this document by first reading the table of contents for Chapter 3 which lists the titles describing the recommendations for setting social standards for proposed Wilderness areas of Zion National Park. These readers should then read Chapter 3 to get a more complete description of the recommendations that were developed based on the information discussed in Chapters 1 and 2.

Readers of Chapters 1 and 2 should note that each of the sections in these chapters begins with an italicized summary of the information in that section. These summaries are intended to guide readers' attention by helping them anticipate the direction in which the discussion is headed, but they may also stand alone for the reader wishing to get a "once-over-lightly" view of the document.

All readers of this document should take special note to carefully read the statement preceding the first recommendation in Chapter 3. It is a brief but very important discussion of the limitations of social science research and the role of interpretation in using it to make recommendations.

STATEMENT OF WORKING DOCUMENT

The purpose of this document is to provide a clear and concise statement of the work to be performed. This document is intended to serve as a guide for the project and to ensure that all parties involved are aware of the scope, objectives, and deliverables of the project.

The project will be managed in accordance with the following principles:

- Transparency: All project activities and decisions will be documented and shared with all stakeholders.
- Communication: Regular communication and reporting will be maintained throughout the project.
- Flexibility: The project plan is a guide, not a constraint. Changes will be made as needed to respond to evolving requirements.
- Accountability: Each team member is responsible for their own work and for the success of the project as a whole.

The project will be organized into the following phases:

- Phase 1: Planning and Preparation
- Phase 2: Execution and Monitoring
- Phase 3: Evaluation and Reporting

The project will be completed by the end of the fiscal year. The final deliverables will be presented to the steering committee for review and approval.

INTRODUCTION

Zion National Park is currently formulating a management plan that will include a description of planned policies concerning the areas of the park that have been proposed for legal designation as Wilderness -- areas that Zion National Park (Zion) has committed to manage in accordance with the Wilderness Act of 1964¹. Formulating such plans for managing Wilderness is a complex task primarily because the Wilderness Act (like the National Park Service Organic Act) requires managers to balance conflicting goals concerning resource protection and provision for quality visitor experiences. The Zion planning team has adopted the Visitor Experience and Resource Protection (VERP) planning model as a means of producing a management plan that strikes an appropriate balance between the mandated goals and serves as a useful document in the ongoing management of the park.

VERP, like the Limits of Acceptable Change (LAC), Visitor Impact Management (VIM), and other similar programs that preceded it, is centered around the selection of *indicators* and the definition of *standards*. Indicators are specific elements of the resource and social environment that are indicative of the general quality of the resource or social environment, and standards are descriptions of the point at which resource or social conditions are no longer consistent with management priorities (see Stankey, Cole, Lucas, Peterson, and Frissell, 1985; Graefe, Kuss, and Vaske, 1987; and National Park Service, 1997 for descriptions of LAC, VIM, and VERP, respectively). Normally, VERP relies heavily upon the collection of social science data to provide information useful to the process of setting social standards. However, funds are not currently

¹ Throughout this document I will capitalize the word Wilderness when referring to areas that have been legally designated or proposed for designation as such. Consistent with this, I will also capitalize phrases such as Wilderness experience.

available at Zion to conduct such research. Given this constraint, the team of managers and planners working at Zion determined that the best remaining strategy for using social science data in the process of setting social standards would be to review the available information gathered in relation to the process of setting social standards at other Wilderness areas and to search for insights that could be generalized to Zion.

Two Types Of Information Reviewed

Wilderness management is a complex undertaking, and the material that might plausibly be reviewed in this document concerns many of the most complex issues involved. It would be beyond the scope of this project to follow all relevant lines of inquiry to their logical conclusions. Thus, it has been necessary to limit the range of this document. The structure of the document consists of three primary chapters that reflect the limitations of the review. The first chapter reviews two areas of research, one measuring visitor evaluations of their encounters with other Wilderness users while traveling through Wilderness (generally referred to hereafter as *encounters*), and the other concerning Wilderness visitors' opportunity to camp out of sight and sound of other parties (*campsite isolation*). These research findings are discussed in relation to the use of encounters and campsite isolation as social indicators in the proposed Wilderness areas of Zion, and in terms of the standards for these indicators that might be selected for use in the park. Encounters and campsite isolation are only two of an immense set of possible social indicators that might be selected for use at Zion, but they are the indicators that have currently received the largest combination of research attention, empirical support, and use in management plans.

Introduction

Because of the volume of research published concerning visitor evaluations of encounters and campsite density, this review focuses on primary sources such as research reports or empirical articles only for literature published since 1986. It relies upon a number of review articles published between 1984 and 1986 to summarize the research conducted before that time period.

The second chapter of this document reviews literature and reports conversations with managers and researchers concerning the process of setting social standards and the context in which the information reviewed in the first chapter should be applied. This chapter is organized as a series of important issues that are relevant to the selection of social standards at Zion. Issues are discussed and summarized under each of the following headings:

- Social standards cannot be empirically determined.
- How important are encounters with other visitors?
- Appropriateness in zoning Wilderness.
- Public input in the process of setting and implementing social standards.
- Descriptive data are crucial in the process of setting social standards.
- The problems associated with day-hiking.

The third and final chapter of this document discusses the implications of the review for the process of setting social standards for the proposed Wilderness areas of Zion. These implications are discussed in relation to the Wilderness zones proposed by the Zion planning team and range from very specific quantitative recommendations to general suggestions for the ongoing process of management planning. Most of the implications follow from the reviewed research and issues discussed in the first two chapters of this document, but some additional information is also

integrated from the recommendations of persons with experience in setting and implementing social standards for Wilderness areas.

A Word Concerning The Power Of Terminology

Throughout this document special care will be exerted to make appropriate use of the terms *social carrying capacity* and *norm*. The need for this care has become evident in the course of reviewing the literature and considering the history of Wilderness management. The specific reasons why each of the terms above are problematic will be discussed later in this document, but for introductory purposes it is sufficient to note that words and labels often carry complex meanings and implications, and that those implied meanings can have real effects that interfere with communication and conceptual progress if they are not recognized. In simple language, the words we use matter because they can carry more meanings than what we intend. One of the conclusions of this review is that clearly specifying and agreeing upon precise definitions of the terms *social carrying capacity* and *norm* can help the Zion planning team make better decisions concerning social standards.

CHAPTER 1

RESEARCH CONCERNING POSSIBLE STANDARDS FOR TWO POTENTIAL SOCIAL INDICATORS: ENCOUNTERS WITH OTHER PARTIES WHILE TRAVELING AND OTHER PARTIES CAMPED WITHIN SIGHT OR SOUND

Evaluation Of Encounters With Other Parties While Traveling Through Wilderness

The evaluation of Wilderness encounters has generally been measured by surveying visitors to a Wilderness area and asking them to make an evaluative judgment concerning encounters with parties of other Wilderness visitors. In a review of survey questions that have been used to develop standards for backcountry settings, Donnelly, Vaske, and Shelby (1992) found that such questions have been asked in a wide variety of formats. In all of the questions reviewed, visitors were asked to make some form of evaluation described as preference, acceptability, tolerance, appropriateness, or consistency with Wilderness experience for various numbers of encounters (with the number sometimes provided by the researcher and sometimes specified by the respondent)². Two examples illustrating the most common types of questions are, "About how many hikers do you prefer to see per day, when you are hiking in a *wilderness area*?" and, "What would be your feelings about seeing 3 canoers per day?" with a five-point response scale ranging from "Very Unpleasant" to "Very Pleasant". When aggregated across respondents, answers to these questions can be used to estimate the number of encounters at which about half the respondents give a negative evaluation. Following the example of earlier reviewers of these data, this review will focus upon such aggregated numbers in discussing the research in this area. Also

² Although the definition of what constitutes an encounter has usually been left to respondents, the minimum level of contact generally acknowledged is that the other party must be in view.

following from earlier reviews, the research results are generally labeled as reports of “acceptable encounter levels” with the understanding that the questions used in specific studies may have used adjectives other than “acceptable”.

1.1 Summary of research measuring evaluations of encounters.

In this section, a review of studies investigating Wilderness visitors' evaluations of encounters with other visitors yields the following conclusion: for most studies, when respondents were asked in the context of a Wilderness experience, more than half negatively evaluated encounters with more than five other parties.

The appropriateness and usefulness of encounter evaluations as a social indicator, as well as the question of whether the methods used in these research efforts yield valid responses will be discussed later in this chapter. First, however, the results from a wide range of existing studies are summarized in Table 1. It should be noted that some of the issues discussed later concern the use of the term *norm* or *encounter norm* as labels for visitors' aggregated responses concerning numbers of encounters. Although I have intentionally avoided using such terms in my discussion to this point, they are commonly used in the existing research and many researchers would refer to Table 1 as a summary of encounter norms.

Table 1. Summary of studies investigating Wilderness visitor evaluations of encounters with other visitors.

Citation	Study Area	Study Population	Evaluation Of Meeting:	Median Acceptable Encounter Level
WATERBORNE RECREATION				
Stankey 1973 ¹	Boundary Waters Canoe Area	Wilderness Visitors	# Of Paddling Parties	3.5
Schreyer & Nelson 1978 ¹	Westwater Canyon	Whitewater Rafters	# Of Parties Seen On Trip	2
Shelby 1981 ¹	Desolation Canyon Grand Canyon	Whitewater Rafters	# Of Parties Seen On Trip	1.5
		Public Meeting Participants	"Wilderness" River Encounters Per Day	0.9
			"Semi-Wilderness" River Encounters Per Day	2.4
	Rogue River	River Users	"Undeveloped Recreation" River Encounters Per Day	4
			"Wilderness" River Encounters Per Day	1.5
			"Semi-Wilderness" River Encounters Per Day	2.9
Illinois River	River Users	"Undeveloped Recreation" River Encounters Per Day	4.4	
		"Wilderness" River Encounters Per Day	0.7	
		"Semi-Wilderness" River Encounters Per Day	2	
Shelby & Stein 1984 ¹	Klamath River	River Floaters	"Undeveloped Recreation" River Encounters Per Day	2.7
			"Semi-Wilderness" River Encounters Per Day	3
Williams, Roggenbuck, & Bange 1991	New River Gorge 1983	Visitors Expecting Wilderness Trip	# Of Boats Seen Per Day	6
		Visitors Expecting Scenic Trip	# Of Boats Seen Per Day	15

Chapter 1. Research Concerning Two Potential Social Indicators

Watson 1995	Boundary Waters Canoe Area 1991	Wilderness Canoe Paddlers	# Of Paddling Parties Per Day (Acceptable)	8-10
			# Of Paddling Parties Per Day (Preferred)	5
Lewis, Lime, & Anderson 1996	Boundary Waters Canoe Area 1991	Wilderness Canoe Paddlers	# Of Paddling Parties Per Day (Acceptable)	2.6
LAND RECREATION				
Kuss & Fedler 1985 ¹	Pemmigewasset	Wilderness Visitors	# Of Backpacker Parties Seen Per Day (Acceptable)	19.8
			# Of Backpacker Parties Seen Per Day (Preferred)	9.5
Cole, Watson, & Roggenbuck 1995	Shining Rock 1990	Wilderness Visitors	# Of Parties Encountered On A Three-Day Trip	Approx. 8
	Desolation 1990	Wilderness Visitors	# Of Parties Encountered On A Three-Day Trip	Approx. 12
Williams, Roggenbuck, Patterson, & Watson 1992	3 Southeastern Wilderness Areas & Rattlesnake In MT	Wilderness Visitors	# Of Hiker Parties Passed Along Trail Per Day	11.6 ³
Hammitt & Patterson 1993	Great Smoky Mountains National Park 1987	Overnight Backcountry Visitors	# Of Parties Along Trail Per Day	1.7 ²
Hammitt & Rutlin 1995	Ellicott Rock Wilderness 1993	Wilderness Visitors	# Of Parties Along Trail Per Day	4.1 ⁴
McCool & Haydock 1976	Zion National Park 1976	Narrows Hikers With Low Scenery & Escape Expectations	# Of People Seen On Trip	5 - 10 (3.3) ⁶
		Narrows Hikers With High Scenery & Escape Expectations	# Of People Seen On Trip	1 - 2 (1) ⁶
Hall & Shelby 1996	Eagle Cap Wilderness	Wilderness Visitors	# Of Parties Contacted Per Day Before Trip Ceased To Be a Wilderness Experience	4

Taylor, Pratt, & Catton 1990	Zion National Park 1989	Backcountry Visitors (Bias Toward Narrows)	# Of Parties Contacted Per Trip (Consistent With "Backcountry Experience")	5
Hollenhorst & Stull-Gardner 1991a	Dolly Sods 1991	Wilderness Visitors	# Of Parties Contacted Per Trip ("Too many") # Of Parties Encountered Per Day (Tolerable)	21 ³ 8.7
Hollenhorst & Stull-Gardner 1991b	Cranberry 1991	Wilderness Visitors	# Of Parties Encountered Per Day (Preferred) # Of Parties Encountered Per Day (Tolerable)	2.6 4.9
Stankey 1973 ¹	Three Western Wilderness Areas	Wilderness Visitors	# Of Backpacker Parties	2.5
Stankey 1980 ¹	Desolation Wilderness	Wilderness Visitors	# Of Backpacker Parties	9.5
	Spanish Peaks Wilderness	Wilderness Visitors	# Of Backpacker Parties	4.5
Vande Kamp, Johnson, & Swanson 1998	Mount Rainier National Park (Spray Park) 1993	Wilderness Visitors	# Of Parties Encountered Per Day While In Spray Park	approx. 4 ⁵

¹ Cited in Vaske, Shelby, Graefe, & Heberlein (1986).

² Calculated by dividing encounters per trip by average trip length in days.

³ Mean encounters -- usually higher than medians due to effect of outlier responses. For example, the Taylor et al. (1990) data yielding a median of 5 parties yield a mean of 14.7 parties.

⁴ Maximum number at which visitors could achieve privacy.

⁵ Estimated based on maximum acceptable encounters of 6 per hour, average time in area of 2 hours, and average group size of 3.

⁶ Number of parties per day estimated as 3.3 and 1.

Table 1 is divided into sections representing waterborne and land recreation. Within the waterborne recreation section data are reported from ten studies of 8 different settings. Five of those studies reported more than one form of encounter evaluation, with the multiple evaluations representing whether the trip was intended to be a Wilderness experience or some other form of trip. Looking across all ten studies and selecting the median encounter levels reported in relation to “undeveloped recreation” and “scenic” experiences for the five studies reporting multiple forms of encounter evaluations, we find a range of 1.5 to 15 encounters with eight of the studies reporting median acceptable encounter levels of 4.4 or less, and a mean of 4.72 encounters. Selecting the median encounter levels reported in relation to “Wilderness” experiences for the same five studies and aggregating across the ten studies reviewed yields a range from 0.7 to 6, and a mean of 2.67 encounters per day.

The data for land recreation are somewhat more difficult to interpret. Within this section, data are reported from 15 studies of 18 different settings (some results are reported as aggregated data from several settings). Four of these studies reported more than one form of encounter evaluation, but the different figures did not neatly correspond to Wilderness vs. non-Wilderness experiences³. The mean estimates reported by Taylor, Pratt, and Catton (1990) and Williams, Roggenbuck, Patterson, and Watson (1992) also complicate the interpretation of these data because means are much more strongly affected by extreme responses than are medians and are thus usually larger for these types of encounter estimates. Keeping these complications in mind and selecting the highest encounter evaluations from the four studies reporting multiple figures,

³ Two of the studies with multiple figures reported median preferred encounters and median acceptable (or tolerable) encounters, one reported figures for visitors with high scenery and escape expectations vs. those with low scenery and escape expectation, and the last reported median encounters consistent with a “backcountry experience” and the mean number of encounters judged to be “too many”.

we find a range of 1.7 to 21 encounters with ten of the studies reporting median acceptable encounter levels of 4.9 or less and two of the remaining five figures being means rather than medians. The mean of these 13 medians and two means is 7.09 encounters. In contrast, when the lower encounter evaluation figures are selected we find a range of 1 to 11.6 encounters with 12 of the studies reporting median acceptable encounter levels of 5 or less and one of the three remaining figures being a mean rather than median. The mean of these 14 medians and one mean is 4.77 encounters per day with other parties^{4,5}.

Several researchers who have reviewed subsets of these results in the past have concluded that the numbers are relatively consistent and have made statements supporting the conclusion that the findings can be generalized across a variety of Wilderness areas. Vaske, Donnelly, and Shelby (1993) conclude their review of encounter evaluations from nine studies with the statement, "...although encounter norms [i.e., encounter evaluations] vary for different activities and different areas, there is some consistency in the norms for certain types of experiences. For example, norms for encounters during a Wilderness experience tend to be quite low (about 4 or fewer encounters in most cases)." (see also Vaske, Graefe, Shelby, and Heberlein, 1986). Similarly, Manning's 1985 review article argues that frequent reports of Wilderness acceptable encounter levels in the 1-3 encounter range represent the preferences of a relatively large, homogeneous group of back-country recreationists, and his later review (1993) states, "Wilderness hikers...generally prefer encounters with not more than three other groups per day along trails."

There is even a precedent for using these general conclusions in setting social standards in a

⁴ For the purposes of this analysis, the 5-10 and 1-2 people per trip figures reported by McCool and Haydock (1976) were translated to 3.3 and 1 party per day.

⁵ This analysis mixes two measures of central tendency and weights small and large samples of Wilderness users evenly. It is provided here as a rough summary of the research results but more direct examination of the median acceptable encounter levels forms the basis for quantitative recommendations.

Southwestern backcountry area. One off-trail social standard in the VERP implementation plan for Arches National Park (National Park Service, 1995) was aimed at limiting encounters to three or fewer, and was set "...based on studies of visitors in wilderness areas, which indicate that three to five parties encountered per day is what average visitors are willing to accept."

The data in Table 1 are generally consistent with the evaluations of previous authors. Even if we consider only the largest figures reported from each study, 16 of the 23 studies reviewed⁶ reported median acceptable encounter levels of 5 or less. Even more striking, one could argue that consideration of the numbers appropriate to Wilderness (those asking about Wilderness or backcountry conditions) would increase that figure to at least 19 of 23 studies.

Consistency with previous summaries would not be as strong if one considered only the research results from the land recreation section of Table 1. Research results from that section are generally more variable and report slightly higher acceptable encounter rates than those from the waterborne recreation section. However, results from both the land and waterborne recreation studies should be relevant to recreation in Zion's proposed Wilderness—when hiking through the canyons of Zion, visitors are generally confined to the narrow canyon floor in much the same way that rafters or canoers are generally confined to a river or watercourse. In contrast, hikers in other areas of the Zion backcountry can move around large areas, hiking on or off trails. Thus, the range of experiences at Zion may be similar to the range of land and waterborne recreation experiences for which research was reviewed⁷.

⁶ Twenty articles are cited in Table 1. Shelby (1981) reports separate figures for three wilderness areas and Stankey (1980) reports figures for two areas. Thus, the total number of separate figures for encounter evaluations is 23.

⁷ In reviewing this document, McCool and Hall expressed some reservations concerning the analogy of Zion slot canyon hiking to river rafting experiences. However, they did not state that such reservations invalidate the general conclusions and recommendations drawn from the research.

Although the statements made by previous reviewers and the analysis of Table 1 above summarize the general findings of the research concerning visitor evaluations of encounters with other visitors, many issues remain concerning the degree of importance we should place upon these results and their proper use in setting social standards for Zion. Several of these issues are discussed below.

1.2 Do visitors at a wide variety of Wilderness areas make similar evaluations of encounters?

The literature specifically addressing whether evaluations of encounters are similar across Wilderness settings supports the conclusion that at least half of Wilderness visitors will give negative evaluations to the idea of daily encounters with approximately five or more other parties when asked to imagine a traditional Wilderness experience. More specific conclusions or evaluations of encounters for less solitude-oriented experiences cannot be supported by the research evidence.

Although the general consistency of the research results reviewed above and the conclusions of the previous researchers support the conclusion that most Wilderness users in any traditional, low-density backcountry area feel that more than about 5 encounters per day is inappropriate, several articles have directly addressed the question of whether it is indeed possible to generalize research results across geography and time. Roggenbuck, Williams, and Watson (1993) report that although visitor evaluations of encounters vary considerably within each of four Wilderness areas they studied (three in the Southeast and one in Montana), the results across all four areas are remarkably similar. However, another discussion of the same data (Williams, Roggenbuck, Patterson, and Watson, 1992) points out that the mean values for unacceptable encounter levels from the four studies reviewed (approximately 11.6 encounters) were considerably higher than the values (medians) reported by Vaske, Graefe, Shelby, and Heberlein (1986). Although mean values are often higher than medians due to the effects of extreme responses, the authors

proposed that the best explanation for the discrepancy could be a shift over time in which Wilderness users have come to accept more encounters. Some recent evidence does not support such a historical shift. Cole, Watson, and Roggenbuck (1995) compared tolerance for encounters across 12 to 22 years at three different Wilderness areas and concluded, "There is no clear evidence that today's Wilderness visitors are any more or less tolerant of encounters with other groups than their predecessors."

The most extreme argument for generalizability is that made by Higgins (1992) who argues that there should be nationwide social standards that define the most extreme social conditions that can be considered compliant with the letter and intent of the Wilderness Act. He argues that these standards should not define the desirable conditions for all Wilderness, but instead that they should serve as upper boundaries. In a rejoinder, Mitchell (1992a) does not address the potential usefulness of national standard as upper boundaries, but argues that national standards adopted without site-specific modifications would fail to match the appropriate social conditions that differ widely across Wilderness areas. Although the issue of national social standards is somewhat tangential to our more specific question concerning the generalizability of encounter evaluations, relevant points can be made based on both sides of the debate. First, standards generalized across areas should be considered as ranges that define general boundaries within which the appropriate number of encounters is likely to be found. And second, a precise and site-specific estimate of the maximum number of encounters visitors find acceptable is dependent on site-specific research. A discussion of "professional standards" (Manning, 1993) supports these points by concluding that although there is not enough empirical and managerial agreement to support such standards,

future work might support their development for some situations. Notably, the number of trail encounters in Wilderness areas is put forward as a standard that might achieve such consensus.

Certainly there is an opportunity to see variability rather than consensus in the results reported in Table 1, and to find arguments against the generalizability of the summarized findings. Recall the discrepancy noted by Williams, Roggenbuck, Patterson, and Watson (1992) between their recent encounter evaluations from four Wilderness areas and the consensus of the Vaske, Graefe, Shelby, and Heberlein (1986) review. However, much or all of this discrepancy, as well as others evident in Table 1, can be accounted for by variations in the research methods and/or data analysis. The data generally support the conclusion that when asked in the context of a Wilderness experience, at least half of Wilderness users will give negative evaluations to the idea of daily encounters with five or more other parties⁸. Although this is an important conclusion, it is also limited. The issues considered in much of the rest of this document make clear the limitations of these encounter evaluations as a means of setting social standards at Zion.

1.3 Who is being surveyed in studies of encounter evaluation? Why is the sample important?

Persons sensitive to visitor density are sometimes displaced from popular Wilderness destinations as use increases, potentially affecting survey conclusions concerning evaluations of encounters. Evidence for such displacement effects is both limited and mixed. When interpreting social survey data it is important to remember the limited population whose responses are represented.

It takes no great insight to observe that the responses of the visitors surveyed in the studies of encounter evaluation reviewed above may not represent the visitor populations who visited those

⁸ Many of the studies reviewed did not include a response option such as, "I care about encounters but can't specify a number where they become unacceptable." When provided such an option, some respondents use it (Hall and Shelby, 1996). When the response option is not provided, it is not clear whether such respondents would pick a number anyway, or refuse to respond. This general conclusion obviously applies only to visitors who somehow indicated a number of encounters that would yield a negative evaluation.

areas in the past or who visit them now. Voluntary displacement is an important phenomenon that could affect the results of such studies across time, limiting their usefulness to managers. In their early review, Graefe, Vaske, and Kuss (1984a) cite evidence that visitors sometimes moved to less crowded areas as use increased, and sometimes were not displaced. Research published since that time has continued to yield inconsistent results (c.f., Hammitt and Patterson, 1991; Williams, Roggenbuck, and Bange, 1991; Kuentzel and Heberlein, 1992; and Vande Kamp, Johnson, and Swanson, 1998). However, many researchers have concluded that displacement is a real and common effect (Manning, 1993).

When displacement does occur it will increase the proportion of visitors who are relatively insensitive to encounters and should thus increase the average number of encounters that are deemed acceptable (or preferable, appropriate, etc.). Such displacement effects may be responsible for the relatively high median acceptable encounter levels reported by several of the studies in Table 1 (conversely, the lack of displacement in traditional, low-density Wilderness areas is consistent with the consensus in relatively stringent encounter evaluations for those areas). In any case, the relevant point to be made concerning displacement is that the possibility of its presence means that survey results such as evaluations of encounters with other users are potentially variable across time. Such displacement effects are inconsistent with the findings of Cole, Watson, and Roggenbuck (1995), who found no evidence for such changes. However, the fact that visitation levels were relatively stable across time in two of the three Wilderness areas they studied limits the power of their study to test for changes due to displacement.

A comparison of the two studies from Table 1 that report data collected at Zion reveals a pattern that may be consistent with a displacement effect in the Zion Narrows. In 1976, more

than half of Narrows hikers said that it would be unacceptable to see more than five other *people* during their trip (McCool and Haydock, 1976). In 1989, half of Narrows hikers said that encountering five other *parties* during their trip would still be consistent with a backcountry experience, and the average number of parties judged to be "too many" was 21 (Taylor, Pratt, and Catton, 1990). Much or all of the differences in these results may be due to the fact that the 1990 study included hikers who had ventured only a short distance into the Narrows from the end of the Riverside Walk while the 1976 respondents were contacted at Orderville Canyon, several miles into the Narrows. However, the differences might also be due to either displacement or a major redefinition of the expected Narrows experience (such "product shift" effects are discussed in section 2.2). If either of these latter possibilities is true, the data reveal an important issue that should be confronted in the current planning process.

Although the potential for displacement has important implications for the interpretation of encounter evaluation data, a more important observation concerning the limited populations surveyed by the research reviewed above is that the users of any given Wilderness area do not represent all potential users of that Wilderness, and certainly do not represent the even larger population of all citizens who have a legitimate say in the management of the area⁹. Further consideration of this point concerning the interpretation of survey data as "public" feedback will be made in chapter two of this document.

1.4 Do evaluations of encounters measure social norms?

Although measures of visitor evaluations of encounters with other visitors are commonly referred to as encounter norms, the evidence suggests that they are rarely consistent with conventional norm theory. Encounter evaluations do not support prescriptive inferences (that visitors feel that no more than a specified number of encounters should occur) and evaluations

⁹ Of course, surveys also vary in how well they measure the views of current users, but such shortcomings are qualitatively separate from limitations based on the population that is sampled.

of specific numbers of encounters show little consensus in all but traditional solitude-oriented Wilderness settings.

Some of the attraction to the encounter evaluation methodology can be attributed to its origin within the conceptual framework of social norms. In his introduction to a special issue of *Leisure Sciences* devoted to normative perspectives on outdoor recreation behavior, McDonald (1996) states:

This normative approach has great appeal because it can help to identify users' preferences for regular patterns of behavior, as well as evaluations of conditions that can be used by recreation resource managers as standards for managing facets of the recreation experience. Although definitions of the concept sometimes differ, researchers generally agree that norms are evaluative rules that involve some level of shared group agreement or consensus, and focus on what is appropriate behavior, social, and environmental conditions for a given situation. The use of such an approach assumes that visitors have normative standards concerning relevant aspects of recreation experiences and that these norms can be identified and used as a basis for formulating standards relevant to that experience.

McDonald's definition of norms is consistent with the common use of the term in sociology. However, a more psychological definition of norms might exclude the requirement of group consensus and focus on the role of norms as evaluative rules that individuals use to specify the conditions that *should* predominate. This less stringent definition of what will be hereafter called personal norms is not better or worse as a theoretical construct, but it is not the theoretical construct that was originally used to justify the normative approach to setting social standards. Distinguishing between group and personal norms becomes relevant in reviewing the encounter evaluation research.

Several recent studies (Noe, 1992; Williams, Roggenbuck, and Bange, 1991) have questioned a number of assumptions underlying the normative approach, with Roggenbuck, Williams, Bange, and Dean (1991) concluding that what is really being measured in most encounter norm research

is neither a group nor personal norm, but a generalized value for what is desirable or good regarding social conditions. Their point is that most measures of encounter evaluations include no unambiguous normative terms such as should, ought, or must; a point reiterated by Heywood (1996). Heywood also points out that under conventional norm theory, when a norm is incongruent with social conditions, persons holding the norm should impose some form of sanction in an attempt to reach congruence. Such sanctions have not been measured in outdoor recreation applications of the norms approach. A recent review of questions utilized in encounter norm research (Donnelly, Vaske, and Shelby, 1992) also supports these points.

A logical reaction to the inconsistency between conventional norm theory and the methodology of encounter norm research would be to ask if it really matters. Why should the number of encounters people rate negatively on any scale be any less informative than the number that they provide when asked how many encounters should occur? The point is not to argue which measure is better, but that they are not interchangeable. Problems can arise when we measure positive and negative evaluations of encounters but then assume that such measures have a prescriptive importance consistent with the measurement of norms¹⁰. Assigning such importance follows naturally when we refer to all encounter evaluations as encounter norms. This is an example of how our words or labels are important. Let's turn to one piece of research from Table 1 to illustrate this point. In a study of Zion Narrows hikers (Taylor, Pratt, and Catton, 1990), the mean response to the question, "What is the greatest number of contacts with other groups you could have before it ceased to be a backcountry experience?" was 14.7 (the median was 5). Such data are commonly described as measuring an encounter norm and similar results

¹⁰ Respondents may, in fact, interpret questions about the *acceptability* of various numbers of encounters as asking for a social norm. However, research has not established that such interpretations predominate. Without such evidence it is hazardous to assume that questions about acceptability are measuring norms.

have been used in a prescriptive manner to set social standards. However, in this same study the interviewers also asked a follow-up question, "How many groups are too many?" The mean response to this question was 21.1. Such differing responses leave us wondering which question elicited a norm—did either one? Until researchers more thoroughly measure the prescriptive components of what are commonly referred to as encounter norms and demonstrate the conditions under which true encounter norms can be demonstrated and measured, *encounter evaluations* is a more appropriate label for the research findings that are currently available. Some of these studies may measure traditional norms, but at this point we should be wary of assigning all studies the prescriptive significance that follows from the label "norm" and "normative".

Questions concerning the level of consensus present in encounter evaluations have also been raised as a challenge to the norm label. Roggenbuck, Williams, Bange, and Dean (1991) found that fewer than half of New River Gorge whitewater rafters could even give a specific number when asked about appropriate encounter levels, and that over one quarter said encounters did not matter to them. They also report low consensus among even the minority of respondents who reported such numbers. Hall and Shelby (1996) report similar data for the Eagle Cap Wilderness in Oregon, a lightly to moderately used area (as described by the authors) in which most people meet fewer than 10 groups per day. The level of consensus among those who provided numbers at Eagle Cap was slightly greater than that at New River (the middle 50% of Eagle Cap responses fell between 2 and 6 encounters, compared to 2 and 10 for the New River Wilderness encounter data).

Hall and Shelby (1996) offer an important argument concerning the interpretation and usefulness of encounter evaluation data that do not show high levels of consensus. They suggest that actual encounters are so variable (a discussion of such variability is included in section 1.6) that ranges of evaluations like those found at Eagle Cap are sufficient to inform management decisions (i.e., the knowledge that 75% of visitors feel that more than 6 encounters is not consistent with a Wilderness experience can be used effectively in setting social standards). Their argument supports the usefulness of the general finding from section 1.1 that more than half of Wilderness visitors in most settings negatively evaluate more than five encounters per day with other parties.

Although measures of variability are not readily available for the studies in Table 1, visitors to traditional, low-density Wilderness areas (areas in which most visitors encounter fewer than about six other parties per day) are thought to show greater consensus in their evaluations of encounters than visitors to higher use areas (Vaske, Donnelly, and Shelby, 1993). Given that the median acceptable encounter levels in Table 1 for most such low density areas were considerably smaller than 5, and that those studies very likely included responses from visitors who did not care about encounters but were nonetheless asked to provide a number of encounters they deemed acceptable, it is probably safe to adopt and generalize the viewpoint of Hall and Shelby (1996) who state, "...those who care about encounters and can give a norm [i.e., provide a number of acceptable encounters] tend to prefer very few encounters, regardless of their type of activity, trip, or experience." The major remaining caveat is that such a generalization applies only to traditional, low-density Wilderness experiences. It is not clear that such experiences are the only type that visitors feel are consistent with Wilderness designation.

Data concerning encounter evaluations in higher density Wilderness experiences (Vande Kamp, Johnson, and Swanson, 1998; Roggenbuck, Williams, Bange, and Dean, 1991) support the idea that such evaluations are more highly variable than those for experiences offering more solitude. This variability is difficult to reconcile with traditional norm theory. Even more difficult to fit into the norm framework are data recently reported by Cole (1997) who studied six very high density day-hike destinations in Washington and Oregon. He found that a large proportion of visitors to these areas were experienced, committed Wilderness users, most of whom reported that visiting such crowded, impacted destinations was atypical of their Wilderness trips. Although Cole did not measure encounter evaluations, the conclusion of this review and of earlier literature reviews would strongly suggest that when asked about a Wilderness experience most such visitors would negatively evaluate more than five or six encounters per day. However, even though these visitors had experienced encounter rates as high as one every 3.2 minutes, more than 80% of them did not support limits to reduce use. These data suggest that in high-density areas, if evaluations of encounters are collected in the context of Wilderness experiences, calling such evaluations encounter norms and assuming that they include a prescriptive component could lead managers to believe that visitors would support policy changes that, in fact, most visitors would strongly oppose.

1.5 Do evaluations of encounters measure anything at all?

Researchers have discussed the possibility that studies of encounter evaluations have no validity because respondents are creating responses that do not represent any stable personal values. This extreme possibility has generally been rejected but the data concerning encounter evaluations offer stronger support for qualitative than for quantitative conclusions.

In discussing the consistencies and inconsistencies found in evaluations of encounters, Williams, Roggenbuck, Patterson, and Watson (1992) offer the possibility that in studies of encounter evaluations respondents have simply stated a number because they were asked to provide one, not because of any stable underlying mental picture of what constitutes a Wilderness experience. They argue that such guessing of responses might yield the pattern of data they found in the four studies discussed in their paper, that of high variability within studies but striking similarities across areas and time (a pattern also consistent with many of the studies in Table 1). On the other hand, they cite the consistent differences in evaluations of different kinds of encounters (e.g., backpackers vs. horseback parties) as evidence that the evaluations are more than simple guesses. They conclude that future research is necessary to untangle the high variability in encounter evaluations.

If visitors' evaluations of hypothetical encounters (i.e., the type of encounter evaluations most commonly collected) were unrelated to their responses when confronted with actual encounters then we might conclude that encounter evaluations are simply created on a spur-of-the-moment by visitors and have no real validity. The research addressing this possibility has generally found mixed results (Manning, Johnson, and Vande Kamp, 1996). However, even studies showing a poor correspondence between evaluations of hypothetical and actual encounters generally show evidence that the hypothetical measures have some validity. For example, Hammitt and Patterson (1993) reported that although 81 percent of backpackers encountered more parties than the number they said would be acceptable in a hypothetical encounter evaluation, only 34 percent reported that encounters detracted from their experience (see also Patterson and Hammitt, 1990). In other words, over half the respondents who experienced a number of encounters they had

indicated to be unacceptable failed to report a negative reaction. Still, the hypothetical evaluations were not a random measure, because fully 93 percent of the group who said that encounters detracted from their experience had experienced more encounters than they had earlier judged to be acceptable. Part of the seeming inconsistency in these data might be explained by positing that respondents are providing imprecise "ball-park" figures. Nonetheless, further research is also necessary in this area to explain such inconsistent findings.

Based on Williams, Roggenbuck, Patterson, and Watson's (1992) discussion of the possibility that encounter evaluations may be spur-of-the-moment judgments, as well as the argument from section 1.2 that encounter evaluations are generally not measuring norms, and the research comparing hypothetical encounter evaluations to actual encounter evaluations, we are left with considerable uncertainty concerning the validity of encounter evaluations. Still, such judgments seem to be measuring a meaningful aspect of the Wilderness experience for at least some visitors. Thus, the body of research supports several conclusions. However, these conclusions are primarily qualitative rather than quantitative. First, in all Wilderness settings some visitors do not care about encounters (c.f., Hall and Shelby, 1996). Second, when asked what is consistent with a Wilderness or backcountry experience, visitors who do care about encounters negatively evaluate more than about five encounters with other parties. Third, evaluations of encounters cannot be equated with normative judgments because such evaluations are inconsistent with three important characteristics of norms (i.e., that they include a prescriptive implication that encounters should be no higher than the specified level, that social sanctions will be invoked if that level is exceeded, and that there be social consensus concerning the appropriate number of

encounters). Fourth and finally, the measurement and interpretation of evaluation encounters becomes more complex as the number of encounters increases.

1.6 How can evaluations of encounters be translated into management action?

The use of encounter evaluation data in management is complicated by several factors including difficulty in accurately monitoring encounter rates of more than six-to-eight parties per day, and by the nonlinear and unknown relationship between visitor density and encounter rates.

If encounters with other visitors is selected as an indicator of experience quality and social standards are set in terms of encounters, it is then necessary to monitor encounters and take management action if standards are exceeded. In a recent discussion of encounter monitoring, Hall (1993) concluded that the cost and effort necessary to obtain accurate encounter estimates increases for higher numbers of encounters. Below about eight groups encountered, the accuracy of visitors' recall is good. These data are generally consistent with earlier research that found accurate recall of about six or fewer encounters (Graefe, Vaske, and Kuss, 1984a; Shelby and Colvin, 1982). At encounter rates higher than six-to-eight, Shelby and Colvin report that recalled encounters and encounter diary data tend to underestimate encounters by about half. If this underestimation were consistent, one might be able to still make use of recalled encounters by appropriately weighting the data, but data collected at Mount Rainier (Vande Kamp, Johnson, and Swanson, 1998) argue against such consistency. Members of the same party who were surveyed as they left a popular sub-alpine meadow were asked how many encounters they had with other parties while in the area. The intraclass correlation between the ratings of members of the same party was 0.5 -- a statistically significant relationship, but far short of practical consistency.

Accurately monitoring encounter rates higher than six-to-eight promises to be a relatively difficult and/or expensive proposition.

Even if high encounter rates were easy to monitor there are questions concerning the strength of their correspondence with encounter evaluations as they are currently collected. Manning (1993) makes the point that the hypothetical way in which encounter evaluations are collected may lead respondents to provide a number representing the number of encounters that are memorable or salient to their experience, and that many actual encounters, particularly those with recreationists similar to the respondent, may not be considered in the evaluative judgment (a study of the use of photographs in the evaluation of biological impacts [Shelby and Harris, 1985] supports this argument). Based on this point, Manning argues that encounter evaluations should be considered a stringent criterion for acceptable encounters, particularly when actual encounters are accurately monitored.

As in many of the issues discussed thus far, the problems associated with measuring (or monitoring) encounters is more troublesome in relation to high numbers of encounters than fewer. In low density areas the number of encounters are more consistently remembered and the relationship between evaluations of hypothetical encounters and actual evaluations can be more safely assumed (although caution is still advised).

A final issue concerning the translation of encounters to management actions concerns the relationship between encounters and visitor density. It cannot be assumed that a ten percent reduction in Wilderness visitors will yield a ten percent reduction in encounters. Shelby and Heberlein (1984) state, "One can not simply assume a relationship between use level and visitor contacts; in each setting this must be established empirically. There is substantial variation within

settings, and data are not yet sufficient to support generalizing from one setting to another, even when the settings seem similar.” Part of the complexity of the relationship between density and encounters may arise because some visitors will alter their behavior to limit encounters as visitor density increases (Manning, 1993). If Zion uses encounters as a social standard, it will need to examine the relationship between visitor density and encounters. Although the practical difficulties associated with such research may be daunting, it is likely to yield more valid results in environments where fewer than about eight encounters are common.

1.7 Should encounters be adopted as an indicator of quality for Zion’s proposed Wilderness?

Adoption of social indicators without careful consideration of the specific characteristics of the area to be managed is not recommended. However, if such selection is absolutely necessary, distilled experience and the amount of available information suggest that encounters with other Wilderness visitors is a top candidate.

The heading above is intended to introduce a discussion, but this discussion will not necessarily answer the question posed. The primary case against adopting encounters as an indicator does not suggest that encounters are a poor indicator, but argues against the adoption of any indicator without careful consideration of the specific character of the area to be managed. A recent evaluation of LAC (McCoy, Krumpe, and Allen, 1995) emphasized that indicators should not be hastily copied but must be carefully defined, accounting for the unique characteristics of each resource, and Mitchell’s (1992a) arguments against national Wilderness management standards make a similar case. Such recommendations are certainly well taken, but accounting for the characteristics of Zion’s proposed Wilderness requires research and data that are not currently available. Might it be possible to select an indicator as the best available for current use?

Data from 100 scientists collected by Merigiano and Krumpe (n.d.) show that of 211 social, biological, and physical indicators listed, the number of groups encountered per day was ranked fourth highest as the indicator that best met the criteria for usefulness. Furthermore, at least 70 percent of the scientists agreed that encounters were consistent with each of eight positive attributes that indicators should have. The only social indicator higher on the list is the number of visitors per day, which ranked first on the list. However, a strong case can be made for encounters over total visitors because it is more closely related to the visitor experience (Brunson, Shelby, and Goodwin, 1992). Thus, the consensus of the researchers surveyed by Merigiano and Krumpe is that in the absence of additional information, encounters is as good a social indicator as any.

The considerable existing research concerning Wilderness users' evaluations of encounters reviewed above, and the evidence that it can be generalized to traditional Wilderness experiences in a variety of environments, also argue for the use of encounters as a social indicator for the Zion planning process. No other alternatives have received comparable attention.

Based on the data and literature reviewed to this point, a case will be made for setting encounter standards in the proposed Pristine Zone for Zion's proposed Wilderness (see section 3.1). However, the case is much weaker for the other proposed Wilderness zones (see section 3.3). In addition, the possibility that some areas of Zion's proposed Wilderness may be better served by site-specific indicators and standards should also be recognized. Section 2.5 of this document includes a discussion of the uses of descriptive data that emphasizes how features of the Wilderness environment can produce bottlenecks where use may be concentrated or social

impacts may become more salient. Such bottlenecks can be used to define indicators and set standards that may be superior to generic indicators such as encounters per day.

Other Parties Camped Within Sight Or Sound

1.8 Summary of research concerning evaluations of other parties camped within sight or sound.

Research shows that most visitors interested in a Wilderness experience prefer to camp out of sight and sound of other parties.

The research concerning visitor preferences for the number of other parties camped within sight or sound is much more consistent and simple to interpret than that concerning encounters. Research suggests that Wilderness visitors generally prefer a campsite far away from others. In his review, Manning (1985) cites four studies, each showing about 75 percent of visitors preferring no other camps within sight or sound. Shelby and Heberlein (1986) report results from the Grand Canyon and Rogue River that are consistent with those numbers. Cole, Watson, and Roggenbuck (1995) found that at least half of visitors to Shining Rock and Desolation Wilderness areas would be dissatisfied if more than 2 parties camped within sight or sound but because they used a different question format than the previously cited studies it is not clear what percentage of visitors in their report preferred to camp alone. In the most relevant study on this topic, the survey of hikers in Zion's proposed Wilderness by Taylor, Pratt, and Catton (1990) found that 49 percent of respondents felt that more than one camp within sight or sound was inconsistent with a backcountry experience. This result probably indicates a misleadingly high tolerance for other campsites because the sample includes an unknown, but potentially large number of persons who

were surveyed as Wilderness visitors but had hiked only a short distance beyond the end of the Riverside walk. With or without such a sampling bias, the data suggest that the social standards for even the least solitude-oriented of the Zion Wilderness zones should allow a maximum of two parties camped within sight or sound.

1.9 Should the opportunity to camp out of sight and sound of other parties be adopted as an indicator of quality for Zion's proposed Wilderness?

Evidence that campsite isolation is an important aspect of a Wilderness experience and distilled experience suggest that camping out of sight and sound of other parties is a good candidate for selection as a social indicator in Zion's proposed Wilderness. Research and legislated mandates support a standard of no other campsites within sight or sound for the proposed pristine zone but the appropriate standards for other zones are not clear.

Backpackers generally prefer that there be few other parties camped nearby. They also tend to agree that being able to camp out of sight and sound of other parties is important. On three Alaskan rivers with low use, 88 percent of visitors agreed that campsite encounters detract from their experiences (Whittaker, 1992), and a variety of other studies have found that camping alone is a more important determinant of experience quality than a variety of other social and resource conditions (Roggenbuck, Williams, and Watson, 1993; Shindler and Shelby, 1992; Stewart and Carpenter, 1989; Graefe, Vaske, and Kuss, 1984a). The most important criterion for a good social indicator is that it should represent a significant impact on the visitor experience (Whittaker and Shelby, 1992); thus, the strong link between camping alone and experience quality supports the use of opportunity to camp out of sight and sound of other parties as a social indicator.

As discussed in relation to encounters above, arguments have been made against the selection of indicators without special attention to the unique characteristics of the area to be managed.

However, if one is forced to select an indicator without the information necessary to tailor that selection to a particular area, the opportunity to camp out of sight and sound of other parties is a good choice. Of 211 potential indicators considered by 100 scientists, the number of other groups encountered at campsite was rated ninth highest as a useful indicator (Merigliano and Krumpe, n.d.).

The evidence that camping out of sight and sound of other visitors was an important aspect of a Wilderness experience and the consensus of scientists concerning its usefulness as an indicator suggest it is a good choice as an indicator for which standards can be set in Zion's proposed Wilderness. The social data, combined with the wording of the Wilderness Act, support a strong argument that in the pristine zone (intended to offer the most solitude of the proposed zones), all visitors should be able to find campsites isolated from other camps. The appropriate standard for the other proposed zones is less clear, but data collected at Zion (Taylor, Pratt, and Catton, 1990) suggest that even in the least solitude-oriented zone backpackers should not find it necessary to camp with more than two other parties camped within sight or sound¹¹.

¹¹ It is important to distinguish between opportunities to camp in isolation and the actual occurrence of such conditions. Parties may sometimes camp within site and sound of each other even when it is not necessary. Standards and monitoring plans should not confuse opportunities and actualities.

CHAPTER 2

ISSUES RELEVANT TO THE PROCESS OF SETTING SOCIAL STANDARDS

The first chapter of this document focused on information and discussion concerning two potential indicators of experience quality and the standards for those indicators that might be adopted for Zion's proposed Wilderness. Such specific information is only useful, however, if it is used appropriately in a more inclusive process of setting management goals and policy that forges a workable compromise between resource protection, provision of high quality visitor experiences, and other Wilderness use goals. In introducing a publication summarizing a 1990 workshop concerning the role of standards in Wilderness management, Shelby, Stankey, and Shindler (1992) state:

It is critical to see standards as part of a larger process. The value of systems such as LAC, C-CAP, and VIM [and VERP] is that they provide a framework within which standards develop from a process; they are means to an end, not an end in themselves. The careful identification of issues, selection of relevant indicators, formulation of management objectives, and systematic inventory and monitoring of conditions and performance are equally crucial elements in these processes. Although setting standards is a key step in these processes, it remains only a necessary, not sufficient, condition for their successful implementation.

In reviewing the literature concerning social standards and talking with scientists and managers concerning their experience with planning processes it became clear that certain issues are repeatedly emphasized. This section discusses those issues and presents conclusions in a form relevant to the planning process at Zion. Many of the conclusions may be unsurprising and the issues may be familiar to many readers, but their persistence in the literature and in the experiences of persons working in the area suggest that an explicit reminder of the issues can help the Zion planning process avoid some common pitfalls.

2.1 Social standards cannot be empirically determined.

Although researchers have repeatedly emphasized that social standards cannot be determined empirically and are inevitably a product of value judgments, the language they use continues to imply that social research can stand alone as the measure used to define social standards. Such a tendency may follow from continued use of terms such as such as social carrying capacity and norm that carry unintended meanings. The incorrect assumption that social data can define social standards seems to persist even in LAC and other planning frameworks that avoid the term social carrying capacity and can be seen in the adoption of subjective survey data as social indicators.

The National Park and Recreation Act of 1978 (Public Law 95-625) concerning planning mandates that management plans include consideration of carrying capacity. Thus, the term *visitor carrying capacity* is part of the legal mandate that underlies the development of VERP and recent efforts to use it in planning processes. This incorporation of the term into the laws governing NPS policy may be unfortunate because the terms *visitor carrying capacity* and *social carrying capacity* have similar disadvantages. In the introduction to this document I mentioned that social carrying capacity is a term that carries with it unintended meanings that can be detrimental to its proper interpretation. The primary component of that unintended meaning is the idea that Wilderness environments have a carrying capacity that exists as an objective characteristic, and that determining such capacity is solely an empirical task.

Part of the original appeal of applying the carrying capacity framework to social management issues was its association with empiricism. Stankey (1988) writes, "...it is likely that one reason why the general model of carrying capacity was adopted as a framework for managing use impacts is that it was seen as a 'scientific and objective' approach that would lead to hard, unequivocal answers to the question of 'how much is too much?'" (see Becker, Jubenville, and

Burnett, 1984 for a similar argument). However, for many years it has been recognized that this appeal is illusory. Stankey (cited in Burch, 1984) writes:

Carrying capacity, in my view is not a *scientific* concept, but a *management* notion. The research role in carrying capacity is describing the social and ecological consequences of alternative use levels, thus providing the opportunity for managers to judge whether these consequences are consistent with area management objectives. With each change in objective, the acceptable and appropriate social-ecological milieu also changes. Thus, while research can help managers who are concerned with carrying capacity, it cannot supply answers about what the carrying capacity of a site *is* or *should be*.

Views consistent with Stankey's have been repeated often in the literature (c.f., Manning, 1993; Schreyer, 1984; Shelby, Stankey, and Shindler, 1992) but the research emphasis and language that dominate the literature sometimes suggest that the concept of social carrying capacity as an empirical question is not easily abandoned. For example, the section of Manning's (1993) review that discusses measures of visitor satisfaction, perceptions of crowding, and encounter evaluation research is titled *Determining Social Carrying Capacity*. Similarly, Vaske, Donnelly, and Shelby (1993) state, "Managers are increasingly turning to researchers for help in developing these standards, and normative approaches have great potential to put the issue on an empirical basis." Shelby and Heberlein (1984) refer to evaluation of encounter studies as, "Methodologies to identify these kinds of standards..." And my own language and discussion in the preliminary report that preceded this document falls into the pattern. For example, I wrote, "If the biological and social sciences were sufficiently advanced to reliably and accurately measure biological and social carrying capacity (i.e., to set biological and social carrying capacity standards), then management decisions concerning the numbers of people who should be allowed to enter a given environment would be greatly simplified from their current state." All of these

authors are certainly aware that social carrying capacity is as much a product of value judgments as it is of empirical research. Several of them have even published statements to that effect. Nonetheless, social research is commonly referred to as if it can define social carrying capacity.

In addition to the implied meaning of the term carrying capacity, the meanings of another term commonly utilized in research aimed at setting social standards plays into the tendency to overstate the role of social research -- calling visitors' evaluations of encounters *encounter norms* is problematic. In chapter one we reviewed evidence that in many situations visitors' evaluations of encounters are not consistent with the theoretical meaning of norms. However, because such data are commonly referred to as encounter norms it is easy to assume that they measure the number of encounters that most visitors feel *should* occur in a particular Wilderness area, and that this measure should be used as the social standard for that area. This assumption is incorrect in two ways: 1) because the questions generally ask visitors to evaluate encounters in such a manner that it is unclear whether norms are being measured; and 2) because even if the social research measures well-established visitor norms, measuring what current visitors feel the number of encounters should be in a Wilderness area does not *define* that area's social standard -- other factors and values must also be considered¹².

LAC, VERP and other planning frameworks were developed in response to the reductionistic and overly empirical tendencies observed in efforts to implement social carrying capacity models and they intentionally avoided adopting the carrying capacity terminology. These frameworks, which focused on developing indicators and standards, were a reaction to the carrying capacity

¹² The results of encounter evaluation research might coincide with final decisions concerning social carrying capacity or social standards in a Wilderness area. They could even serve as part of the justification for setting capacity at a specific level. However, the results do not directly measure social carrying capacity or social standards, and do not define either concept.

models' focus on devising ways to answer the question, "How many is too many?" The new frameworks were intended to define acceptable conditions and describe the process by which standards consistent with those conditions can be set (McCool, 1996). Even within these frameworks, however, the task of defining social standards can be incorrectly framed as an empirical question to be answered through social research. Whether using the term *social carrying capacity* or *social standard* we should remind ourselves that we are talking about value judgments that should arise from a social process of compromise, interpretation and public debate. Neither social carrying capacity nor social standards are concepts that can be measured by a social survey or a review of many such surveys. Social research can provide important information useful for planning purposes but does not provide a definition of social carrying capacity or social standards.

An example of how social data has been used to define social standards even in an LAC framework is seen in the Sawtooth NRA Resource Management Plan (Sawtooth NRA, n.d.). One of their social standards for the number of people on trails is that no less than 80 percent of the total number of comments collected each season will be neutral or positive¹³. Thus, the standard is based on visitor evaluations rather than visitor density and is defined by social research (albeit crude research -- the collection of non-random comments). Such a standard is problematic because it will allow the visitor density (the actual number of people present in the area) to vary with any change in the social standards of those visitors who provide comments. This limits one of the primary purposes that standards, in conjunction with indicators, serve. Shelby, Stankey, and Shindler (1992) state, "Standards help in dealing with change. Most fundamentally, they

¹³ The other social standards for people on trails differ only in the percentage of negative comments specified.

provide a base against which the rate and magnitude of change, an inevitable consequence of use, can be measured and evaluated.” The Sawtooth standard, based on visitor judgments, can provide a base against which to evaluate changes only in those judgments (e.g., the percentage of neutral or positive comments might drop from 90 to 85). However, it remains a stable basis for evaluating only the mix of values salient to current visitors and thus defines the value of the experience purely in those terms. It is possible that the number of negative comments could remain stable while the conditions visitors experience could vary widely and in ways that remain unknown to management. Accordingly, values relevant to Wilderness management (even values such as “unconstrained recreation” which are relevant by mandate) will not necessarily be preserved by setting a standard based on visitor comments .

2.2 How important are encounters with other visitors?

Research has found very little or no relationship between visitor density (i.e., the number of visitors in a recreation environment) and visitor satisfaction, but visitor density is associated with changes in who visits Wilderness areas and what type of experience they expect. Thus, opportunities to be out of sight and sound of other visitors are not the determining factor in the level of visitor satisfaction a Wilderness can conceivably provide. Nonetheless, such opportunities are important in management decisions concerning the experience that will be available to visitors. In addition, the Wilderness Act specifies that solitude must be an important consideration in Wilderness management. The proposed Zion Wilderness zones suggest an interpretation of the Wilderness Act that requires outstanding levels of solitude in at least the pristine zone. In contrast, the relative importance of solitude in the primitive and semi-primitive zones is more clearly a value judgment. No matter how much importance is placed on solitude, it must be balanced against a variety of Wilderness values that must be protected by managers.

Demonstrating the importance of encounters with other visitors might be done through two distinct chains of reasoning. First, encounters might be shown to be important if they are a critical factor in the quality of visitor experiences. And second, encounters might be shown to be

important based on legislated mandates to provide solitude. This section focuses on the first of these arguments; the role of encounters with other parties in visitor experiences.

Encounters with other visitors and solitude have often been used in the outdoor recreation literature as if they are two sides of the same coin. However, solitude is commonly understood to be a psychological construct, and visitors report finding solitude in a wide variety of visitor density conditions (Stewart and Cole, 1997). Solitude and the absence of contact with other visitors have probably been used interchangeably largely because the opportunity to be out of sight and sound of other parties is the single aspect of solitude that managers can currently understand and control. Researchers should continue seek a better understanding of the psychological meaning of solitude. However, the discussion in this section will adopt a relatively simplistic definition and focus on solitude as the opportunity to be out of sight or sound of other parties -- increases in encounters with other visitors will be assumed to constitute decreases in solitude¹⁴.

Figure 1. Interrelationships Between Social Impact Parameters (from Graefe, Vaske, and Kuss, 1984a).

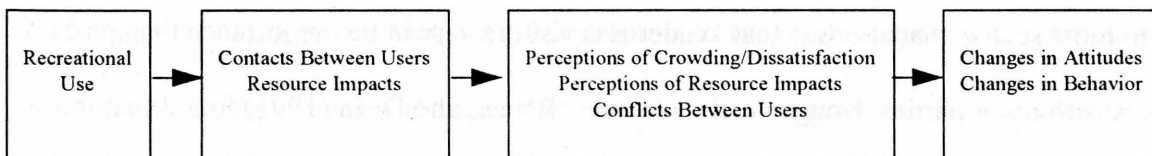


Figure 1 shows a simple model of the social effects of visitor density that was used by Graefe, Vaske, and Kuss (1984a) in their review of social carrying capacity research. Earlier, section 1.6

¹⁴ Visitor density is another term used in this section. It refers to the number of visitors in the recreational environment. Visitor density is correlated with encounters between parties but the two terms are not synonymous.

presented evidence that the relationship between use and encounters is not as straightforward as might be implied by the first solid arrow on the left. In this section we will discuss evidence that the relationship implied by the second solid arrow is also complex¹⁵.

In their review of the relationships between density and visitor satisfaction in more than 50 recreational settings¹⁶, Graefe, Vaske, and Kuss (1984a) found that a negative relationship between visitor density and satisfaction (i.e., the second arrow in Figure 1) was absent from most studies and weak in those where it was observed. Although not all of these studies were conducted in Wilderness areas, the relationship between visitor density and satisfaction was absent even for those that were. Recent research has not altered this basic conclusion. Manning (1993) states, "...little or no statistical relationship has been found between the intensity of visitor use and satisfaction of visitors."

After acknowledging the absence of a direct relationship between visitor density and satisfaction, most authors have gone on to explain several factors that may prevent the observation of such a relationship. One important factor limiting the possibility for such a relationship is the uniformly high satisfaction ratings provided by visitors. This lack of variability in satisfaction limits the strength of any relationship that might exist. A second factor that is integral to most such explanations is that Wilderness visitors vary in the importance they place on encounters with other parties. Roggenbuck, Williams, Bange, and Dean (1991) found that more than one-fourth of New River Gorge whitewater rafters said encounters did not matter to them,

¹⁵ Stankey and McCool (1984) contend that Vaske, Graefe, and Kuss understood the complexity of visitor density effects and presented Figure 1 as a "straw man" against which their review of the literature makes a strong case. Repeating the demolition of the "straw man" is unnecessary and possibly annoying to any scientists reading this document, but is included for readers with less background knowledge.

¹⁶ The reviewed studies included non-Wilderness beaches, woods, and rivers, and the respondents included hunters, sunbathers, fishers, and other persons not expecting a traditional Wilderness experience.

while Hall and Shelby (1996) report similar data for the Eagle Cap Wilderness in Oregon. The evidence of considerable variability in encounter evaluations (see section 1.4) suggests that even among those who care about encounters, some care more than others. Even if exposed to identical levels of visitor density, such a diverse group of visitors could not be expected to show a strong relationship between visitor density and satisfaction.

Given that Wilderness users vary in their desire for solitude and have freedom to choose the areas which they visit, it is extremely unlikely that they would, in fact, choose to experience identical levels of visitor density. Visitors self-select areas that match their values and are likely to produce satisfaction. Thus, it is not surprising that studies find uniformly high visitor satisfaction in both low and high density settings (Graefe, Vaske, and Kuss, 1984a; Stankey and McCool, 1984; Manning, 1993). Studies showing significant differences in the importance of solitude in different Wilderness areas (e.g., Virden and Schreyer, 1988; Whittaker, 1992) support such self-selection effects and their potential to mask a relationship between visitor density and satisfaction.

Satisfaction may also remain stable across recreational settings because visitors may redefine the experience they expect in a particular Wilderness setting based on the visitor density they find. Such changes can be thought of as a product shift that is difficult to detect without longitudinal data collection (Stankey and McCool, 1984). But such longitudinal data were reported by Shindler and Shelby (1995) who found that as visitor density increased, Rogue River floaters were more likely to change their definition of the experience (toward a conception consistent with higher density) than to become dissatisfied. Recent data from six high density Wilderness areas (Cole, 1997) show that even experienced, committed Wilderness users in those areas were

satisfied with experiences in which they very frequently encountered other visitor parties. Such findings are also supportive of product shift.

The phenomena of self selection of recreation experiences and product shift illustrate how visitor density and increasing encounters with other visitors can have significant effects on visitor experiences that are not detected by measuring visitor satisfaction¹⁷. The question of whether such effects represent demonstrations of the importance of encounters with other visitors is not clear. The research shows that changes in visitor density are associated with changes in the type of visitors who visited some areas and in the type of experience Wilderness visitors expect a particular setting to offer, but the research also shows that visitors generally report high levels of satisfaction (Manning, 1993) and can find solitude (self-defined) even in developed zones (Stewart and Cole, 1997). Thus, it is left to Wilderness managers to decide whether, within their Wilderness settings, the visitor population being served and the type of experience the setting provides is appropriate. Decisions concerning the level of importance attributed to encounters with other visitors will follow from such value judgments.

Although the reviewed social data show that many visitors value opportunities to be out of sight and sound of other visitors, they also demonstrate that such opportunities are not important to all visitors and that even those who value them may be highly satisfied with the high density Wilderness experiences to which they have become accustomed or which may be satisfactory for the evaluated trip (recall the product shift discussed above). Based on these latter findings, Zion managers cannot assume that all Wilderness visitors will support limitations on use that are intended to decrease encounters between visitors. Watson and Niccolucci (1995) report that

¹⁷ Other factors such as behavioral changes (Shafer and Hammitt, 1995), expectations and preferences, the method by which satisfaction is measured, and the type of other groups encountered (Stankey and McCool, 1984; Manning, 1993) may also help explain the lack of a relationship between visitor density and satisfaction.

most visitors support limitations on Wilderness access (even those that will limit their own access) if they feel the Wilderness is “beyond capacity” but it is not clear what use levels define such conditions. Even visitors who report feeling some level of crowding cannot be assumed to support use limits (West, 1981).

The point that Wilderness managers should consider encounters with other visitors to be important is more directly established by legislative mandates than by social data. The Wilderness Act of 1964 specifies that Wilderness areas will provide outstanding opportunities for solitude. Still, it leaves managers to interpret what is meant by the terms *outstanding*, *opportunity*, and *solitude*. Given that legislative mandates are considered an important parameter in defining social standards (Whittaker and Shelby, 1992), such interpretations are critical to the task of setting social standards for Zion’s proposed Wilderness.

The definitions of the proposed Zion Wilderness zones suggest that the planning team is interpreting the term *opportunity* as implying that all areas in Zion’s proposed Wilderness need not offer the same levels of solitude. Further, the definition of the pristine zone suggests that the term *outstanding* is being interpreted to mean a level of solitude that would satisfy visitors for whom solitude is very important, and who thus prefer to spend most days without seeing other parties. A discussion of the advantages associated with this interpretation of *opportunity* is postponed until section 2.3. However, this interpretation of *outstanding solitude* is supported by the reasoning presented by Stankey and McCool (1984) who write, “What data from the literature amply demonstrate is that low levels of encounters and associated qualities (e.g., little evidence of others, quietude, low levels of resource impact) are important and valued experiences for many persons and that there is a need for the provision of opportunities featuring such experiences and

for management programs to insure their maintenance.” Clearly, they would argue that the pristine zones of Zion’s proposed Wilderness should offer truly outstanding opportunities for solitude and that such opportunities are defined (in part) by an absence of encounters with other visitors.

The number of encounters appropriate for the primitive and pristine zones and the importance that such encounters should be assigned in setting social standards for those zones is not made clear by either the Wilderness Act or by the information reviewed in this document. Thus, the relative importance of solitude in those zones is better established through other aspects of the planning process such as public input and management judgments of appropriate Wilderness use¹⁸.

It is important to remember that although encounters with other visitors have received a dominant share of research attention, they are not the only important aspect of the visitor experience in Wilderness. Other important values must sometimes be carefully considered in management decisions concerning social standards. For example, a social standard that all parties should camp out of sight and sound of other parties might possibly require a reduction from current use levels unless parties were required to camp in specified sites (i.e., without campsite reservations, fewer parties will be able to share the environment because they do not disperse themselves evenly). In such a situation, instituting a campsite reservation system would avoid the imposition of use limits and show that managers are not falling into the trap of asking only, “How many visitors is too many?” (McCool, 1996), but it would also constitute a restriction on the freedom of the Wilderness experience. Cole (1995) argues against such restrictions, saying, “I would argue that restrictions on behavior, applied within the Wilderness, conflict more with the

¹⁸ Existing research suggests that current visitors to Zion’s proposed Wilderness are likely to hold heterogeneous views on the importance of solitude. Thus, even site specific social research will probably not serve to establish that solitude is a critical component in determining the quality of Zion Wilderness experiences.

intent of the Wilderness Act (with its concern for 'unconfined recreation') than a limitation on amount of use..." Similarly, George Nickas, the Wilderness Watch policy coordinator, said that designated or reserved campsites are a restriction on freedom that are only justified by natural resource concerns (personal communication). Other discussions of the value visitors place on freedom in Wilderness recreation also emphasize its importance (Knopf, 1988; Propst and Kurtz, 1989) and support Cole's argument.

The sources cited in the above paragraph argue that in Wilderness minimizing encounters between visitors should not be emphasized at the cost of freedom. However, Wilderness managers in the NPS and the NFS have traditionally interpreted the balance between these values somewhat differently, with the NPS being willing to more tightly regulate visitor activities. This discussion is not intended to suggest that the Zion planning team should necessarily follow a different course. Instead, it is intended to make it clear that the trade-off between encountering other visitors and unconstrained recreation should be considered in the process of setting social standards.

The values associated with encounters between visitors and unconstrained recreation are not the only values that should be of concern to the Zion planning team. There are also a variety of other Wilderness values that should be considered in planning and management. Manning (1992) discusses recreation, spiritual, cultural, therapeutic, aesthetic, intellectual, moral, and economic values associated with Wilderness. Many of these values may benefit by decreasing encounters between visitors, but managing to thus emphasize solitude, or even to emphasize both solitude and freedom will not necessarily protect them all.

2.3 Appropriateness in zoning wilderness.

Zones are a long-recognized and empirically supported means of managing for a range of experiences desired by a variety of visitors. Wilderness zones that allow high visitor density offer management advantages but may be inconsistent with the Wilderness Act. Even the use of Wilderness zones may be inconsistent with the strictest interpretation of the Wilderness Act. Decisions about Zion zones and the social standards associated with them are difficult to justify based on available data and existing arguments concerning appropriate Wilderness zoning. Thus, such decisions are potentially controversial.

Since Wagar's 1964 introduction of the idea of social carrying capacity, Wilderness managers have recognized that visitors arrive in the Wilderness with different motivations and a variety of expected experiences (Stankey and McCool, 1984). Accordingly, the need for a spectrum of outdoor recreation opportunities has been a common theme in the outdoor recreation literature (Manning, 1985). The VERP planning framework has adopted the concept of zones as a means of managing for such a range of recreation opportunities.

One of the primary advantages of zones is that they provide a means of explicitly offering choices to visitors. Mitchell (1992b) describes the system of backcountry zones at Grand Canyon National Park as sending a clear message to visitors that if they desire high solitude they should choose to visit an appropriate zone. Such choices are important not only because they are easy for managers to explain and for visitors to understand, but also because they are likely to increase visitors' perceptions of control over their experience, and decrease noncompliance and other negative visitor reactions to managerial policies (Propst and Kurtz, 1989).

The usefulness of Wilderness zones intended to provide a range of solitude is supported by a variety of research. Visitors' desire for solitude has been found to differ across and within Wilderness areas (Roggenbuck, Williams, and Watson, 1993; Virden and Schreyer, 1988). Also, evidence of a sort of self-zoning can be inferred from research showing that visitors found in the

interior of Wilderness areas are more sensitive to encounters than those found at the periphery (Manning, 1993) and that visitors utilize proactive behaviors to control their experiences (Shafer and Hammitt, 1995).

Cole (1997) makes an interesting and potentially controversial argument concerning solitude and Wilderness zones. He reports that in six very high use Wilderness areas of Oregon and Washington, visitors are commonly found to be very experienced and committed Wilderness users. Nonetheless, they express satisfaction with their trips to the high density locations and do not support use limits in those areas. If managers decided to limit use in order to reduce the number of encounters in these areas by even half, they would displace a huge number of people and spread impacts over a large area that currently offers much greater solitude opportunities. Cole states, "Surprisingly and counterintuitively, the benefit-cost ratio of use reduction is lowest in high-use destinations." Based on this cost-benefit argument, Cole suggests that philosophical acceptance of less than outstanding opportunities for solitude in very small Wilderness areas (what he calls "minuscule portions") will allow managers to use concentrations of visitors to their advantage. If such conditions are philosophically unacceptable and policy is set accordingly, then managers will immediately find it necessary to intensively manage a large area of Wilderness in order to prevent increased use and impacts from being shifted and dispersed¹⁹.

The question of philosophical acceptability alluded to by Cole (1997) is often discussed in terms of interpreting the Wilderness Act. By proposing zones with varying degrees of solitude, the Zion planning team has already diverged from the most strict interpretation of the Act and

¹⁹ Intensive management of the entire Wilderness area may be necessary even if high densities are judged to be philosophically acceptable. However, such management would be motivated by larger societal changes such as increased visitor use rather than by a policy decision, and such changes would probably occur more slowly than the immediate displacement of large numbers of visitors from high-density Wilderness destinations.

may face opposition because of that decision. George Nickas, the policy coordinator of Wilderness Watch (personal communication), stated that from the perspective of Wilderness Watch all Wilderness falls under the same legislation and that the small area of land preserved should not be diminished by allowing the periphery to be managed inappropriately. In contrast, a recent editorial by the regional director of the Wilderness Society (Whitney, 1997) argues that the goal of Wilderness protection will be better supported if every acre of Wilderness is not managed to the same pristine standard.

Given that the Zion planning team's decision to define a variety of acceptable solitude levels corresponding to the proposed Wilderness zones, the question of philosophical acceptability becomes one of defining the maximum number of encounters (or the maximum level of another indicator of social conditions) that are consistent with both the Wilderness Act and Zion management priorities for Wilderness. Current planning models suggest that visitors should be provided with a spectrum of recreational opportunity, but the entire spectrum need not be present in Zion's proposed Wilderness, or even in Zion as a whole. The spectrum of opportunity necessary in a given park is dependent on a system that may be local, regional, or national (Manning, 1993). Based on these factors, arguments could be made to set the upper limit for the encounter social standards in all zones of Zion's proposed Wilderness at a level as low as one encounter per day higher than the social standard in the pristine zone.

On the other hand, the political and practical difficulty associated with large reductions in Wilderness use, and the related issues discussed by Cole (1997), suggest that it may be advantageous to set the upper limit for encounter social standards in Zion's proposed Wilderness at a much higher level. Cole's finding that Wilderness visitors did not favor restriction even when

they encountered as many as one party every four minutes provides support for such high density standards²⁰. As discussed earlier, standards specifying visitor densities even half as high as those observed by Cole would clearly require a philosophical debate, but they have been seriously proposed as an option.

Many aspects of Wilderness Zones are likely to generate controversy; these aspects range from the question of whether to use them, to the definition of the social standards associated with them. Existing information does not offer strong guidelines concerning many zone-related decisions and arguments have been made for zones with an incredibly wide range of visitor density. The Zion planning team should carefully consider these arguments in order to define zones that are appropriate and workable for Zion's proposed Wilderness areas.

2.4 Public input in the process of setting and implementing social standards.

Public participation has been a hallmark of successful LAC-based planning processes. It can decrease plan opposition and increase compliance. It is also likely to produce a plan that better represents the wide range of possible Wilderness values. Survey data can be thought of as one important form of public participation, but all forms are necessary to keep a management plan in step with the socially constructed meaning of Wilderness.

One of the most important lessons that can be learned from the experiences of LAC planning efforts is the importance of intimate public participation in the planning process. In a summary of LAC experience, McCool (1996) reports, "Intimate public participation has become one of the hallmarks of successful LAC-based planning in the U.S." This statement is supported by a survey of 23 leaders of LAC-based planning processes (McCoy, Krumpe, and Allen, 1995) who reported that LAC efforts including a citizen task-force component "did a more complete job of writing

²⁰ Managers should keep in mind that there is some risk in generalizing Cole's findings to Zion, a different physical and social environment than the area in which Cole collected data.

physical, social and managerial attributes...for their planning area” than those conducted by the agency alone. They concluded that “...with increased dialogue there is likely to be a higher degree of compliance with the LAC system, a higher degree of public and agency interaction, and a higher level of agreement (consensus).” The further benefits of such public participation include more complete implementation and enforcement of the management plan.

One way in which public participation can decrease opposition to implementation of a management plan is by giving participating groups a sense of ownership over the planned policies. Such perceptions of control decrease the likelihood that management actions will be seen as arbitrary or unjustified and can limit the intense opposition arising from psychological reactance (Propst and Kurtz, 1989).

Public participation in planning may produce a more complete list of attributes for the planning area because it involves people who value Wilderness for a wide variety of reasons. Manning (1992) calls for social research to broaden its current focus on the recreational value of Wilderness, and to address spiritual, cultural, therapeutic, aesthetic, ecological, scientific, intellectual, moral and ethical, and economic values. However, until such a broadening occurs, inclusion of such values in the planning process is likely to come only from public participation by persons holding a wide range of values²¹.

One of the reviewers of this document (McCool) pointed out that public participation in planning processes provides an opportunity for both managers and the public to learn from each other. Both of the arguments for public participation that are discussed in the preceding

²¹ Including a wide variety of groups in the planning process makes it more likely that a broad range of values will be represented but does not guarantee such an outcome. Still, the values of groups who do not participate will certainly be excluded.

paragraphs are consistent with this conception. Managers do not own all the expertise needed to manage Wilderness, and visitors will not support that which they do not understand.

Visitor surveys, including evaluations of encounters, are best conceptualized as an important aspect of public participation in the planning process. It is important to remember that all surveys have limits. For example, visitor surveys usually measure responses of current visitors, not all potential visitors or all members of the public who have a legitimate stake in Wilderness policy (see section 1.3)²². Also, visitor surveys do not always ask the right questions. Nonetheless, visitor surveys are a critical component of public feedback because they provide a means for the viewpoint of the average user or general public to be represented (Whittaker and Shelby, 1992), and because they are the only form of public input that should not be biased by self-selection of the persons or groups providing input.

A final argument for public participation is that it grounds the plan in the evolving social context of the national meaning of Wilderness. "Wilderness is ultimately a cultural phenomenon. It is defined by the values society ascribes to it and it must be managed accordingly. This will require evolving Wilderness standards in concert with a changing society." (Manning, 1993). A planning process that does not include intimate public participation risks becoming anachronistic, impossible to implement, and ultimately a failure.

2.5 Descriptive data are crucial in the process of setting social standards.

Researchers agree that descriptive data of visitor use, characteristics, and impacts are critical components in planning processes. Such data can describe managerially important bottlenecks where visitor density has its greatest impacts. Descriptive data are also important in assessing the impacts of planned management action and in applying Wilderness zones.

²² Surveys can be designed to sample from populations larger than current users. Such designs would probably be more difficult and costly than the methods most commonly used, but would increase the likelihood that the survey results would truly represent public opinion in the broad sense.

The importance of descriptive data in planning processes has been repeatedly emphasized by researchers and managers. One of the two primary components required by the social carrying capacity framework is an extensive description of use conditions and the impacts associated with those conditions (Shelby and Heberlein, 1986; Graefe, Vaske, and Kuss, 1984b), and statements by researchers involved in later planning frameworks repeat this emphasis. Watson, a researcher experienced in applying LAC, states, "Knowing use levels and basic user and group characteristics is essential in professional Wilderness management" (Watson, 1989). Similarly, one of the primary developers of VERP states, "A strong commitment to visitor-oriented research is needed" and, "Carrying capacity determinations must be made on the basis of objective data from national park visitors" (Manning, 1993).

One might suggest that social scientists like those quoted above have a vested interest in emphasizing the importance of descriptive social research, but the retrospective views of managers involved in LAC processes are consistent with the argument that extensive descriptive information is important in effective planning processes. More than half of 23 leaders of LAC-based planning processes reported that they had insufficient baseline data about Wilderness conditions (McCoy, Krumpe, and Allen, 1995).

One of the primary ways in which descriptive data can be useful is by identifying "bottlenecks" in the Wilderness where visitor density has its greatest impacts. It is generally acknowledged that the impact of encounters with other visitors varies in likelihood and impact across sites (Whittaker, 1992; Graefe, Vaske, and Kuss, 1984b). Thus, social conditions at some sites may prove to be effective indicators of experience quality for much larger areas. For example, Tarrant,

Cordell, and Kibler (1997) found that on the Nantahala river, use levels were more of a concern at rapids than at other locations²³. Identifying such “bottlenecks” in visitor use patterns, using them as indicators, and setting standards for appropriate social conditions in those areas, may provide managers with a much more appropriate plan than the use of generic indicators such as encounters per day. Graefe, Vaske, and Kuss (1984a) are advocating a search for bottlenecks when they write, “It is not enough to ask how many visitors one will tolerate. Studies must go further and ask the question in the context of the particular user groups, times, and places on which the answer depends.”²⁴

When Wilderness is to be divided into several zones, descriptive data can be very useful in helping the planning team decide the appropriate zones for particular Wilderness areas. Although it is not necessary or clearly desirable that all zones match existing use patterns, including any Wilderness area in a zone that requires social conditions very different than those currently in existence should occur only when based on a clear decision that the change in conditions is preferable and justified. Without data describing existing conditions, unjustified and unnecessary changes are likely to be included in the plan.

Descriptive data are also necessary to assess the potential impacts of planning decisions. For example, to assess whether a standard of five encounters per day will require management action it is necessary to know the current number of parties that visitors encounter. More detailed information about users can also be very useful. By knowing the different characteristics of users

²³ Graefe, Vaske, and Kuss (1984a) review another study reporting crowding at river rapids, and Watson (1995) reports that finding unoccupied campsites is a common problem at Boundary Waters. These findings also illustrate bottlenecks that might be managerially important.

²⁴ One of the reviewers of this document (Hall) noted that Grand Canyon National Park has “attraction site” monitoring and standards. Contacting them to discuss management success at these sites could prove useful at Zion.

commonly found at a variety of Wilderness sites, managers can assess whether planned policies will more heavily impact particular user groups. Descriptive data can also be gathered to explicitly assess how visitors are likely to react to management actions. For example, zoning decisions can benefit from anticipating how use might be redistributed under different scenarios (Brunson, Shelby, and Goodwin, 1992), and surveys asking visitors for their alternative destinations can increase the accuracy of such projections.

Finally, descriptive data are necessary to provide a baseline against which the success of management action can be measured. Given the current emphasis on accountability in government, such baseline data are particularly important.

Given the importance of descriptive information, Zion's current lack of much basic descriptive information about Wilderness use (Vande Kamp, 1997) and the absence of funding to collect such information as part of the planning process presents a serious problem. When the Zion situation was described to one researcher, he questioned whether they should even proceed with planning (McCool, personal communication, 1997)²⁵. One of the recommendations in chapter three is that as part of their current planning process, Zion should make a commitment to gather a wide variety of descriptive data as a means of providing information for any changes to the current plan, and in order to contribute to the success of future planning processes.

2.6 The problems associated with day-hiking.

Little is currently known concerning effective management of day-hiking. Day-hikers may have different conceptions of a Wilderness experience than overnight visitors and these views can complicate their management. Nonetheless, the growing number of day-hikers requires that management plans (including plans for Zion's proposed Wilderness) address their presence.

²⁵ Proceeding without such information is clearly a handicap, but Chapter 3 makes a case for moving ahead with the planning process.

Chapter 2. Issues Relevant To The Process Of Setting Social Standards

When asked about information concerning day-hikers and their management, the common response of the managers with whom I spoke was to say that they didn't know of much information, and then to ask if I did! This response illustrates how issues associated with the management of day-hiking are an area of growing concern about which little is known.

Management of day-hikers is problematic partly because they contribute to the heterogeneity of Wilderness visitors. Day-hikers in the Desolation Wilderness have been found to have different perceptions of social and resource conditions than overnight users (Watson and Cronn, 1994), and day-hikers at three Wilderness areas in Oregon were found to be less likely to favor use limits to reduce visitor density than were overnight users (Watson and Niccolucci, 1995). Such differences may contribute to findings that encounter evaluations in higher density Wilderness areas (where most day-hikers are found) are more variable than in lower density areas (Heywood, 1993). Finally, the prevalence of day-hikers in high use Wilderness areas, and the high tolerance for encounters that they exhibit, contributes to the difficulty of applying traditional philosophical views of Wilderness (and corresponding forms of management) to high density Wilderness destinations (Cole, 1997).

Despite the difficulty of formulating appropriate policy concerning day-hikers, the need for such policy is growing. The typical Wilderness visit is one day or less, and growing shorter (Brunson, Shelby, and Goodwin, 1992) and demand for day-hiking opportunities is likely to grow (c.f., Hospadarsky, Johnson, and Brown, 1993).

One method of dealing with day-hiking is to set comprehensive limits on the number of all users who enter a Wilderness area. Aravaipa Canyon provides an example of such a management policy. They allow a maximum total of 50 visitors in the canyon on any given day, with a

maximum stay of three days and two nights. Their policy has been in place since 1970 and although the original justification for that particular number is not made clear in their Wilderness Management Plan (Bureau of Land Management, 1988) the policy has generally yielded high levels of visitor satisfaction and resource protection. Social research has confirmed the high levels of visitor satisfaction but has also suggested that the use limit should be revised to manage the number of parties rather than total visitors (Moore, Brickler, Shockey, and King, 1989).

Comprehensive limits like those at Aravaipa will probably be necessary to effectively manage areas where day-hiking occurs. Based on experience in the Alpine Lakes Wilderness, Brunson, Shelby, and Goodwin (1992) argue that management of overnight use will not maintain social standards. However, considerable creativity can be brought to bear in implementing such policies. One possibility is to implement temporal zones that allow more day-hiking during certain times of the year (or month, or week) and that restrict use at other times (see Mitchell, 1992b for description of seasonal temporal zoning for Grand Canyon river rafting). Given the current lack of information concerning management of day hiking, the Zion planning team has an opportunity to create one of the first management plans to address the issue.

CHAPTER 3

RECOMMENDATIONS FOR SETTING SOCIAL STANDARDS FOR PROPOSED WILDERNESS AREAS OF ZION NATIONAL PARK

Standards provide a professional foundation for resource management. They do this by helping articulate management philosophy, establishing clear and realistic targets for management efforts, helping assign priorities to budgets and management activities, giving field people a focus for their activities, providing management personnel with a sense of accomplishment, and providing a way to measure and recognize performance. Perhaps most importantly, establishing standards forces a careful consideration of the underlying rationale for management; exactly what is it we are trying to accomplish through a program of wilderness management? (Shelby, Stankey, and Shindler, 1992)

Recommendations based on social science fall somewhere between the quantitatively precise guidelines one might receive from an engineer when building a physical structure, and the general advice based on experience and anecdotes that many business experts and consultants provide. The recommendations in this chapter are based on empirical data, but the data, like most social scientific results, are fragmentary and inconsistent. As a result, these recommendations are a product of interpretation and judgment that may go beyond the data in ways that push the rigorous limits normally applied in science. They are defensible, but not irrefutable. Some social scientists working in the area of Wilderness management are less hesitant than I when interpreting social data and making recommendations like those in this chapter. They argue that managers need answers and that social scientists should try to provide those answers, even when they are based on evidence considerably weaker than would be acceptable in a scientific argument. I am somewhat sympathetic to this point of view, but have tried to be cautious when balancing the benefit of providing guidance against the cost of possibly allowing my own values and perceptions to be presented as empirical evidence. Inevitably, some of my values and perceptions are present

in these recommendations, but such biases may also be present even in the recommendations of an engineer. Wilderness managers and other consumers of any scientific information should be more concerned by recommendations that are presented as totally objective than by those that acknowledge the inevitability of some subjectivity when interpreting empirical results. In this realm, as in most others, the consumer must make the final evaluation.

Delaying The Planning Process Is Likely To Make Future Planning And Management Action More Difficult

In section 2.5 a prominent researcher raised the question of whether the process of selecting social indicators and setting standards should proceed without funds to conduct site-specific social research²⁶. The primary argument against halting the process until such funds are available might be thought of as the “some management is better than no management” principle, and it has been recognized for more than twenty years. In 1976, Schreyer wrote, “Avoidance of a specific experience definition allows those activities which can preempt other opportunities to determine the recreational character of the area” (cited in Graefe, Vaske, and Kuss, 1984a). Similarly, Shelby and Heberlein (1986) wrote, “...the failure to make capacity determinations is a de facto decision to move away from low-density recreation.” Finally, Manning’s latest review (1993) suggests that planning and management action should be pursued aggressively because change in visitor experiences is occurring without our knowledge (c.f., Andereck and Becker, 1993;

²⁶ It should be noted that this argument was made (by McCool) to advocate adequate funding of social research and not to advocate that the planning process at Zion should be stopped. The risk of moving forward without adequate funding is that decisions are more likely to lead to counterproductive consequences. McCool argues that this risk should not be minimized.

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Shindler, 1992; Shindler and Shelby, 1995), and such change may be inconsistent with management objectives²⁷.

Experts in the field of Wilderness planning agree not only that some planning is better than no planning, but also that formal planning is better than informal planning and comprehensive planning is better than piecemeal planning. Shindler (1992) writes, “The difficulty with informal standards is that they are undefined, inconsistent, and changeable” while Cole (1995) addresses the importance of comprehensive Wilderness planning. He describes a recent management trend toward the imposition of use limitations only in the most crowded areas of Wilderness, and suggests that such a strategy will produce counterproductive long term consequences by shifting use and problems to other areas within the Wilderness (areas where use may have previously been at appropriate levels). In addition to spreading visitor impact, such piecemeal management action would only delay the inevitable need for comprehensive Wilderness planning and management action.

Together, these arguments suggest that selection of social indicators and setting of social standards for Zion’s proposed Wilderness should move forward and aim to produce the best justified and most comprehensive plan possible. Accordingly, this chapter presents a series of recommendations concerning social indicators, social standards, and the process by which they should be determined. As in previous chapters, some of the points made may seem obvious; indeed, some of these recommendations may already be implemented in the Zion planning process. Nonetheless, it is often important to be reminded of good ideas.

²⁷ Some management may not be better than no management if visitation in Zion’s proposed Wilderness is in a stable and appropriate state. However, growth rates in Zion visitation are very high and show no signs of slowing.

The recommendations are classified into three general groups: quantitative recommendations, process recommendations, and other recommendations. The recommendations are based on the research and issues discussed in chapters one and two, as well as some additional insights from researchers and managers with experience in standards-based planning frameworks.

Quantitative Recommendations

3.1 The social standard for encounters with other parties in the proposed pristine zone in Zion's proposed Wilderness should be fewer than five encounters per day.

The clearest quantitative recommendations drawn from chapter one and two relate to the pristine zone. Encounters with other visitors is one of the best indicators that can be selected for use in that zone without conducting site-specific research. And if selected, this review supports the conclusion that the corresponding standard should be to encounter *no more than* five other parties per day.

Although the reviewed studies do not establish that Wilderness visitors feel that management *should allow* fewer than five such encounters, they do establish that more than half of Wilderness visitors in most settings negatively evaluate more than five encounters in the context of a Wilderness experience. In a zone intended to provide a pristine Wilderness experience with maximum solitude, it can be strongly argued that the social standard for encounters should not exceed the maximum number that most visitors prefer (or deem acceptable, tolerable, etc.).

Care should be taken to note that this recommendation does not specify that the social standard should be no lower than five encounters. Many visitors in reviewed studies preferred to see no other parties, and many studies had median acceptable encounter rates of less than three.

Based on these findings, good arguments can be made for a social standard considerably lower than five encounters.

This maximum social standard (5) for encounters is roughly consistent with other planning efforts in the Southwest. The Arches plan specifies that there should be four or fewer encounters per day in their backcountry and primitive zones (National Park Service, 1995). Similarly, Grand Canyon National Park has wild zones and primitive zones that are managed to provide fewer than one encounter and fewer than five encounters per day, respectively (Mitchell, 1992a).

One Northwest regional standard is slightly less stringent, aiming to provide fewer than seven encounters per day (Smith and Higgins, 1992).

3.2 The social standard for campsite isolation for the pristine zone in Zion's proposed Wilderness should provide all visitors with the opportunity to camp out of sight and sound of other parties.

The evidence justifying a standard specifying the opportunity to camp in isolation from other parties is found in the social research showing that most Wilderness visitors prefer such conditions. In a zone intended to provide a pristine Wilderness experience with maximum solitude, the social standard for campsite isolation should not exceed the conditions that most visitors prefer. The strong evidence that campsite isolation is an important aspect of the Wilderness experience suggests that this may be one of the best social indicators that could be adopted.

Although camping in isolation is important, care should be taken before insuring such isolation by designating or reserving campsites in the pristine zone. Such actions may not be controversial when justified by resource concerns, but in the social dimension they trade increased solitude for

decreased freedom, a trade that some perceive as being inconsistent with the Wilderness Act (Cole, 1995; Nickas, personal communication, 1997).

The recommendation for campsite isolation is consistent with other planning efforts in the Southwest. The Arches plan specifies that visitors should have the opportunity to camp out of sight and sound of other parties (National Park Service, 1995), and Canyonlands manages its backcountry so as to provide backpacking campsites away from other parties (Canyonlands National Park, 1995).

In the Northwest, one standard is again slightly less stringent, aiming to provide visitors to camp out of sight and sound of no more than one other party (Smith and Higgins, 1992).

3.3 Quantitative recommendations of social standards for encounters with other parties in the primitive and semi-primitive zones in Zion's proposed Wilderness are not supported by this review.

Quantitative recommendations for encounter standards are not supported primarily because the degree to which social conditions in the primitive and semi-primitive zones should deviate from the strictest interpretation of the Wilderness Act is even more difficult to argue on an empirical basis, than is the encounter standard in the pristine zone.

Despite the lack of support for specific recommendations, the reviewed studies can provide information useful to the Zion planning team. For example, limited support for setting encounter standards in the primitive zone at five or fewer encounters per day is implied by the same encounter evaluation data that were discussed in section 3.1 concerning the pristine zone²⁸.

²⁸ Practical considerations concerning monitoring of encounters should not be used to justify standards, but they have implications for encounter standards in the primitive and semi-primitive zones. Research suggests that visitors' reports are fairly accurate up to six or eight encounters, but rapidly become inaccurate at higher levels (Hall, 1993; Shelby and Colvin, 1982). Thus, accurate monitoring of a standard allowing more than about eight

However, that argument does not stand as strongly in a zone that is not aimed at providing maximum solitude. Recall from section 1.5 that the encounter evaluation research measures evaluations that do not always predict visitors' reactions to actual encounters. Manning (1993) has also suggested that encounter evaluations may measure visitor reactions to the number of encounters that are salient and may thus represent the absolute minimum number preferred. The existing survey data can serve as a starting point for the process of selecting social standards for the primitive and semi-primitive zones, but go little farther.

In relation to the semi-primitive zone, a research report reviewed in section 2.3 (Cole, 1997) makes a strong argument that very large numbers of encounters should be allowed in some small areas of Wilderness (what he calls "minuscule portions" but doesn't quantify). The Zion planning team could benefit from reading and discussing the implications of this brief but important research report.

The data and issues reviewed in this document can provide information and support for debate, but ultimately the social standards for encounters in both the primitive and semi-primitive zones will be based entirely on the broader planning process.

3.4 The social standards for campsite isolation in the proposed primitive and semi-primitive zones in Zion's proposed Wilderness should provide all visitors with the opportunity to camp out of sight and sound of no more than two other parties.

Although encounter standards could not be recommended for the primitive and semi-primitive zones, this review supports a social standard specifying that in both zones visitors should not have

encounters would require methods more difficult and expensive than simply asking visitors how many parties they encountered. On the other hand, obtaining adequate sample of visitors using low density Wilderness areas also presents practical problems.

to camp within sight or sound of more than two other parties. This recommendation is based on the strong evidence for the importance of campsite isolation discussed in section 1.9, and on survey data collected in Zion that showed more than half of Wilderness visitors felt camping within sight or sound of more than two parties was unacceptable (Taylor, Pratt, and Catton, 1990)²⁹.

Care should be taken to note that this recommendation specifies a minimum level of campsite isolation. Many visitors surveyed in Zion preferred to camp out of sight and sound of all other parties, and the survey sample included an unknown but potentially large proportion of day-hikers (see Vande Kamp, 1997 for a review of Taylor, Pratt, and Catton, 1990) who are likely to have different preferences than backpackers (Watson and Cronn, 1994).

Process Recommendations

3.5 The Zion planning team should document the decisions made concerning Wilderness policy and the process by which they were made.

From the introduction to this document it has been emphasized that planning for Wilderness management is a complex process combining input from a wide variety of sources. In conversations with three persons who have extensive first-hand experience with Wilderness planning processes (including Dave Wood - a planner at Canyonlands, Steve McCool - a scientist at the University of Montana, and Linda Merigliano - a Forest Service employee with extensive LAC experience), all three strongly emphasized the need for documentation of planning decisions.

²⁹ In her review, Hall pointed out that this recommendation is inconsistent with my earlier arguments in that it is more clearly a value judgment of the author than are the other recommendations, and that it is a case in which the standard is being defined based on social science data rather than an integration of many values. These criticisms should be taken seriously and should be weighed in evaluating this recommendation.

Such documentation can serve as an important resource during the process of management planning by allowing participants to review how they have gotten to a particular conclusion and to assess the validity of any assumptions made along the way. Documentation can also be invaluable to demonstrate that management policies have an explicit justification. Shelby, Stankey, and Shindler (1992) emphasize this point, saying, "...standards may need to be aggressively defended. In such cases, the validity of the underlying process as well as the scientific bases of the standard itself will come under scrutiny." Consistent with this point, Mitchell (1992b) describes how management policy changes prescribed by the 1989 Colorado River Management Plan were effectively blocked by commercial outfitters when the NPS could not, at that time, clearly describe exactly the conditions for which it was managing. Finally, Canyonlands is unwillingly providing a current example of a plan placed under intense scrutiny. They are involved in a lawsuit concerning policies regarding access by four-wheel-drive vehicles. Their experience emphasizes that it is wise to document planning decisions as if they were to be examined in court because such examination is a very real possibility.

3.6 The Zion planning team should acknowledge "trade-offs" between planned policies and impacts on existing use patterns and use them in discussions during the planning process.

Another strategy recommended by persons with experience in Wilderness processes is to acknowledge that planning decisions concerning social standards can have a wide range of impacts on management policy and current use patterns. Standards may require large or small alterations in visitor use in large or small portions of the Wilderness area being managed. Although it is important that the Zion planning process seek to specify what the park should be,

experienced persons emphasize that if such plans ignore what Zion currently is, they will probably not be implemented.

Of the sources consulted for this document, Linda Merigliano (personal communication, 1997) most strongly emphasizes the importance of acknowledging “trade-offs”. She states very strongly that successful management plans acknowledge the “real world” considerations that arise when standards specify conditions that are inconsistent with current use. She also points out that the encounter evaluation research measures visitor evaluations when there is no mention of the possible consequences associated with limiting use to such levels, and suggests that visitor judgments about the social conditions that should be present are likely to be very different when the “trade-offs” between solitude and access are made clear (see Hall and Rolloff, 1997 for evidence of such an effect).

The idea of “trade-offs” is also implicit in Cole’s (1997) argument concerning the issues related to high density day-use areas in Wilderness. Managers must wrestle with the implications of displacing use that is currently concentrated in small areas and the possibility that such displacement will negatively impact social and physical conditions in a much broader area.

The most difficult aspect of implementing this recommendation at Zion is that a realistic discussion of “trade-offs” requires considerable knowledge about current social conditions in the Wilderness. At Zion, such knowledge is generally lacking (Vande Kamp, 1997). While this shortage of knowledge is a hindrance, some attempts have been made to describe current use levels in at least a general manner (see Vande Kamp, 1997 and the existing use map completed during planning team exercises). Perhaps these descriptions can serve as a basis for a rough discussion of the “trade-offs” and impacts associated with setting social standards. Merigliano

and other persons experienced in planning processes (Steve McCool; Liese Dean - Sawtooth NRA; Dave Wood) suggest that such discussions are critical in creating an effective plan.

3.7 The planning process should strongly emphasize public involvement and attempts to build consensus or “buy-in” among the interest groups involved.

A third emphasis in conversations with experienced planners was the importance of public participation in the planning process. This point was discussed at some length in section 2.4, supporting a conclusion that intimate public participation is a hallmark of successful planning processes. However, a second important conclusion following from this point should also be emphasized: without public support, even the most comprehensive, coherent, and potentially effective plan will not be implemented. Involving the public can improve the plan but development of consensus is necessary to get management policy implemented.

The importance of consensus is emphasized by a recent summary of experience with the LAC process by McCool (1996). He states that although Wilderness managers have legal power to plan and implement management action, individual interest groups actually have “veto” power over proposed actions due to the political nature of planning. Thus, he argues, at least a “grudging agreement” is necessary for Wilderness managers to implement plans. This emphasis on consensus is not new. In their early presentation of the social carrying capacity planning framework, Shelby and Heberlein (1984) describe three conditions necessary to establish social carrying capacity; two of those were: 1) there must be agreement among relevant groups about the type of recreation experience to be provided, and 2) there must be agreement among relevant groups about the appropriate levels of the experience parameters (i.e., the social standards).

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The earlier recommendation that the Zion planning team should explicitly consider the likely impacts on current use patterns when making planning decisions (section 3.4 above), ties into the emphasis on “buy-in” and consensus. Merigliano (personal communication, 1997) believes that such specific discussions facilitate consensus building compared to more abstract discussions of policy. In her experience, the planning process was more effective when planning teams discussed the conditions that were desirable in specific Wilderness areas and the impacts associated with managing for those conditions (e.g., in Zion the discussion might focus on the impacts of defining Coal Pits Wash as a pristine zone) than when they discussed desirable conditions for Wilderness in general.

Another technique for building consensus is the use of a “step-down” order of management actions (Mitchell, 1992b). As a means of reaching desired conditions, a range of alternative management actions is specified and ordered from least to most restrictive. If users agree about the desired conditions, and monitoring demonstrates that those conditions are not achieved with the least restrictive actions, users are likely to support implementation of a more restrictive management action. Such support might not have been obtained if such actions had been initially proposed.

Properly considering and weighting the input of interest groups, such as commercial interests, in the public involvement process is a problematic aspect of consensus building. Planning processes in Wilderness areas such as the Grand Canyon, Canyonlands, and Sawtooth have all struggled with issues concerning the proper way to balance the priorities of commercial interests against those of other groups. Although conversations with personnel from those areas and other information describing their plans provide few particular recommendations concerning how to

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achieve such a balance, it is worthwhile to note that the Zion team should anticipate that issues related to commercial interests will arise and should be careful not to let those issues dominate planning decisions.

This review did find one research finding that might help managers more accurately (and charitably) interpret the input of commercial interests. Outfitters are sometimes suspected of providing slanted depictions of their customers' preferences concerning social conditions, but a study by Heywood (1987) suggests that such depictions may be more accurate than one might suspect. Groups in which some or all other members are unknown prior to the trip were found to have preferences for adventuresome, socially oriented experiences while those in private groups preferred experiences that provided for quiet, escape, and change. Thus, an outfitter who claims her customers are relatively tolerant of high visitor density may be correct, but those visitors may have different preferences than private parties.

Although the personnel from Grand Canyon, Canyonlands, and Sawtooth emphasized the difficulty in dealing with commercial interests, it is important to note that a wide variety of interest groups (e.g., the Sierra Club, the Wilderness Society, the Audubon Society etc.) are also likely to tailor their efforts in the public involvement process so as to maximize the impact of their views. Whether a particular group favors increased access or greater restriction on Wilderness use, the Zion planning team should be careful to prevent that group's influence from dominating the public involvement process.

3.8. A wide range of values and information are relevant to planning decisions and Zion planners must interpret the role of social research within that context.

The first issue discussed in chapter two was the persistent tendency of scientists and managers to talk about social research as if it can stand alone to define social standards. Whether this tendency is due to the terminology commonly used or to a desire to replace difficult value judgments with formulaic interpretations of data, Zion managers should be careful not to fall into the same trap. The Zion planning team should keep reminding themselves of statements like the following:

“...determining appropriate encounter levels for a recreation opportunity is ultimately a value judgment which must be made by managers. Research on shared crowding norms among recreation groups [i.e., encounter evaluations] will be helpful in guiding such management judgments. But the diversity inherent among outdoor recreation visitors will require an explicit value judgment as to which group's tastes are to be emphasized for each individual recreation opportunity.” (Manning, 1985)

This quote makes an important point, but mentions only a small section of the wide range of values relevant to planning decisions. Not only are the encounter evaluations of a variety of Wilderness user groups relevant in choosing an encounter standard, also relevant are the Wilderness Act, the NPS Organic Act, the Zion National Park enabling legislation, a variety of general social values including recreation, spiritual, cultural, therapeutic, aesthetic, intellectual, moral, and economic values (Manning, 1992), and the unique social and political conditions surrounding Zion. Clearly, asking a sample of Wilderness visitors the number of encounters they prefer or find acceptable cannot be expected to yield a number that represents an integration of all these factors. Such value judgments inevitably and properly fall upon Wilderness managers.

This recommendation could be interpreted as suggesting that social research such as encounter evaluations are insignificant, but this is not the case. Social surveys constitute the only

way of reliably incorporating the views of the average user or general public into management plans (Whittaker and Shelby, 1992) and are therefore critical in creating a plan that integrates the views of many groups. Social research of all kinds is vital in the process of setting social standards, but it must be interpreted correctly in the context of the planning framework.

Other Recommendations

3.9 Zion should make a commitment to collect descriptive information accurately measuring social conditions in all areas of its proposed Wilderness -- the type of information that is currently unavailable. This commitment should extend to ongoing information collection (i.e., monitoring).

The importance of descriptive social information has been emphasized throughout this document and was specifically discussed in section 2.5, titled *Descriptive data are crucial in the process of setting social standards*. The above recommendation concerning the importance of acknowledging “trade-offs” also shows why descriptive information is so important to the planning process. However, because such information would be of most use now and in the immediate future of the Zion planning process, it may seem to be too late for descriptive data collection to serve a purpose. In fact, the collection of such data is a clear case of “better late than never.”

Making a commitment to collect descriptive social data is important because any management plan must be, to some extent, a dynamic entity, and changes in the plan will be more likely to be successful if they are based on accurate descriptive data. Even if changes to the plan currently in development are rare, some future planning team will be asked to write a new plan and will

benefit greatly from any information that is collected from this point in time; information that can serve as a baseline against which to assess changing social conditions.

The type of descriptive data that are needed most are accurate counts of the number of visitors (and groups of visitors) who are currently using specific sites in Zion's proposed Wilderness. Similar information concerning the number of encounters experienced by current visitors and the number of parties camped within sight or sound of current overnight campers would also be extremely valuable³⁰. Such simple data provide a baseline describing current conditions and are also valuable in assessing the degree to which current conditions correspond with proposed social standards.

A second valuable form of descriptive data would be information concerning specific sites and activities where the presence of other visitors most clearly detracts from experience quality. Section 2.5 includes a brief discussion of how such bottlenecks can be used to select effective social indicators and standards. Section 2.5 also describes how descriptive data concerning the characteristics of visitors found at various sites in Zion's proposed Wilderness could be used to assess possible differential impacts of management policy on specific sub-groups of visitors.

Finally, studies measuring visitor evaluations of social conditions (such as numbers of encounters with other visitors) can be useful in setting social standards. However, even site-specific studies of this type must be interpreted appropriately (as discussed in section 3.8).

³⁰ In reviewing this document, Hall argued that measuring encounters is more important than making simple counts. I base my prioritization on the argument that counts are easier to collect and can be used to estimate encounters.

3.10 Zion planners should recognize that some of their greatest challenges in managing Zion's proposed Wilderness will be issues associated with day-hiking.

Section 2.6 discussed the issues associated with day-hiking and concluded with the observations that such issues were an important and growing concern among Wilderness managers, and that little is currently known about how to address the management problems associated with such use. Day-hiking is thought to be a major factor in areas such as the Narrows and the "Subway" that have been the focus of some concern in the Zion planning team. Thus, planning in those (and possibly other) areas will have to address day-hiking.

Because strategies and guidelines for effective management of day-hiking in Wilderness are not established, the Zion planning team has little choice but to be innovators in the field. The team should consider creative approaches to day-hiking management such as temporal zoning and highly automated permit systems, and should make efforts to keep abreast of current attempts by other Wilderness managers to address the same problems. Such efforts to stay informed may yield immediate benefits for Zion Wilderness planning and management because of the growing acknowledgment among managers and researchers that the problems associated with day-hiking must be addressed.

3.11 In some areas of Zion's proposed Wilderness, Zion planners should consider a "cap and assess" strategy.

Based on the "some management is better than no management" reasoning, the Zion management team should consider the option of setting a cap on current use levels in areas of proposed Wilderness where a clear case cannot currently be made for setting specific social standards. With such a strategy there must be an explicit commitment to later set specific,

justified standards based on continuing data collection and planning development (this approach was advocated by McCool, personal communication). Thus, a “cap and assess” strategy can go hand-in-hand with a commitment to collect descriptive social data (see recommendation 3.9 above).

“Cap and assess” is essentially a delay of a necessary management decision. However, it can prevent increases in visitor density that may be inappropriate, but politically and managerially difficult to reverse. The time allowed for further data collection can also put the decisions about standards on a more substantial base of information.

At least one prominent and controversial management plan has had characteristics consistent with a “cap and assess” strategy. Mitchell (1992b) describes the management objectives of the 1989 Colorado River Management Plan as having a “status quo” nature and discusses how managers have since that time clarified the desired conditions for which the NPS was managing, and have monitored visitor experiences and environment conditions. He states that this strategy has been successful in motivating specific management actions and holds promise for future plan revision.

A Final Word Concerning A Complex Systems Perspective On The Process Of Planning Wilderness Management

Developments in the new fields of complexity theory and nonlinear dynamic systems (Kauffman, 1993; Lewin, 1992) have recently provided new theoretical and metaphoric perspectives in a wide range of scientific fields including social science (Eve, Horsfall, and Lee, 1997). These perspectives have many implications for Wilderness management and the general

field of leisure science -- too many implications to discuss all of them here. Nonetheless, one set of insights might prove particularly useful to the Zion planning team.

Zion's proposed Wilderness (or Zion National Park as a whole) can be modeled as an evolving social system that can achieve varying degrees of success in serving the many functions (some of which are contradictory) that it is called upon to serve. Such system models are thought to reveal potentially important aspects of the systems they describe, and four such revelations are particularly relevant at Zion. First, the model reveals that the set of all possible management options (i.e., the set of all possible ways in which the system can reach all possible configurations) is, for all practical purposes, infinite. In such a situation, it is nonsensical to think of the planning process as a search for the perfect method of managing Zion's proposed Wilderness. The best that can be hoped for is to create a plan that yields good Wilderness management. Planners should scale their aspirations in accordance with this more modest goal.

Second, the model reveals that as the system inevitably evolves and changes, the management strategies necessary for Zion's proposed Wilderness to achieve good success in serving its many purposes will also shift. Given this dynamism, a good plan for today will probably not be a good plan in the future. Zion managers cannot expect to put even a very good management plan in place and then plan to rest on their laurels. Faced with a continually evolving system, plans for managing Zion's proposed Wilderness will require periodic changes on large and small scales to avoid becoming anachronistic.

Third, the model shows that the management plans that yield the highest aggregate success are not necessarily similar in form. Significant changes in management strategy carry a risk of decreasing the success of the management system, but they also offer the potential to reconfigure

the system so as to reach a level of success that would have been impossible through smaller incremental changes. This does not imply that management strategies should be altered randomly or that the Zion planning team should not take care before proposing bold departures from the current patterns of use in the Zion Wilderness. The dynamic model does, however, suggest that the risks associated with large management changes are sometimes offset by substantial benefits.

Fourth, and finally a speculative, but encouraging, conclusion concerning dynamic system models was suggested by Kauffman (1995). He argues that the best solutions to dynamic nonlinear problems are found through a process in which individuals with a mixture of shared and conflicting goals interact, debate, and compromise. If his conclusion is correct, the messy political process associated with planning the future management of Zion's proposed Wilderness may represent the optimal means of ensuring that such a plan will be effective. Rather than being discouraged by the inability to reduce management planning issues to systematic formulas, this conclusion suggests that the Zion planning team should wholeheartedly embrace a dynamic and interactive planning process.

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As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural and cultural resources. This includes fostering wise use of our land and water resources, protecting our fish and wildlife, preserving the environment and cultural values of our national parks and historical places, and providing for enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interest of all our people. The department also promotes the goals of the Take Pride in America campaign by encouraging stewardship and citizen responsibility for the public lands and promoting citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under US administration.

