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Perceived Crowding and Visitor Support for Use Rationing: A Reanalysis of Existing Data

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PERCEIVED CROWDING AND VISITOR SUPPORT FOR USE RATIONING: A REANALYSIS OF EXISTING DATA

by

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ABSTRACT

Perceived Crowding and Visitor Support for Use Rationing:

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by

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This thesis presents a reanalysis of data collected between 1999 and 2006 by the Institute for Outdoor Recreation and Tourism (IORT) at Utah State University. These data concern a variety of outdoor recreation sites in Utah, Idaho, and South Dakota, and were collected via intercept, mail, and, to a very limited extent, telephone surveys. Survey instruments contained questions related to visitor perceptions of crowding, overall satisfaction, support for use limits/rationing, and estimates of use density, in addition to other conceptually related factors.

Analyses consisted of multiple regression models for both *perceived crowding* and *visitor support for use limits* dependent variables for each suitable data set. These were intended to ascertain the dependent variables' relationships with various factors hypothesized to contribute to both crowding perceptions and a perceived need for use limits—notably variations in use level. This thesis also incorporated bivariate and univariate analyses intended to investigate the relationship between perceived crowding

and satisfaction, reasons for respondent support for use limits, and the potential of displacing visitors to similar recreation sites via use rationing.

Side-by-side comparison of results yielded several interesting findings. First, use level was the variable most consistently showing a statistically significant association with perceived crowding. However, the amount of variation explained by use level variables was small, particularly from a managerial perspective. Results suggested support for use limits may have more to do with fears about potential changes in future conditions than actual on-site crowding. Results were not suggestive of a strong or consistent relationship between perceived crowding and satisfaction. Apprehensions about crowding were the most prevalent stated reason for respondents' support of use rationing, but concerns about safety at motorized (land- and water-based) sites were also a major factor, as was recreational conflict, though to a lesser extent. Results of all analyses highlighted the uniqueness of each study area.

Overall, results suggested crowding-based recreational carrying capacities may lack utility as a generalized management framework and are perhaps best reserved for sites specifically managed for low use levels or solitude experiences. Results also support calls for regional scale, rather than site-specific, recreation planning.

(291 pages)

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CHAPTER 1

INTRODUCTION

The concepts of crowding and recreational carrying capacities are perhaps the most studied subjects in the outdoor recreation management field (Roggenbuck, 1992; Stewart & Cole, 2001). Crowding, or perceived crowding, denotes a negative evaluation by recreationists of the density of fellow visitors in given recreation sites or areas, while social carrying capacities are management tools intended to mitigate this reaction as well as reduce impacts to the natural environment (*biophysical* impacts) resulting from human recreational use. These concepts first emerged as dominant research areas as a result of increasing use levels in the 1950s and '60s that fueled concern about resulting negative impacts (Manning, 1999). The concern was twofold, being directed both at minimizing environmental degradation and the degradation of visitor experiences managers feared could result from the increasing numbers of visitors to outdoor recreation sites (Hendee & Dawson, 2002; Manning, 1999; Wagar, 1964). Research undertaken in this thesis project will not focus directly on biophysical recreation impacts but instead concentrate on social perceptions of crowding and on carrying capacity research approached primarily in a social crowding context.

While crowding and social carrying capacity have been extensively studied for more than 40 years, significant disagreement about the utility of the concepts has pervaded academic debate for some time now (Stewart & Cole, 2001). Critiques of crowding/carrying capacity focuses and their associated research methodologies have focused on a number of different points. One criticism portrays carrying capacity research as a search for scientific, objective solutions to what are necessarily subjective

management judgment calls (Becker, Jubenville, & Burnett, 1984; Borrie, McCool, & Stankey, 1998; Haas, 2001, 2003, 2007). Others highlight such studies' possibly ideological fixation on limiting use and the potential for elitism associated with use rationing (Burch, 1981, 1984; More, 2002). A related criticism speaks of the propensity for carrying capacity studies and their associated management frameworks to focus on use limitation at the expense of other useful (arguably more useful) management actions, effectively pushing use rationing to the forefront of recreation management tools (Borrie et al., 1998; Burch, 1984; Stewart & Cole, 2001). Other articles have criticized this area of study for a myopic focus on individual sites without regard for broader use trends across larger recreation areas or systems and the potential for displacement rather than mitigation of impacts within the larger geographic area (Blahna & Reiter, 2001; Borrie et al., 1998; Cole, 2000; McCool & Cole, 2001).

Justification for the Study

The presence of such protracted controversy over recreational carrying capacity/use rationing management actions coupled with their frequent use and agency (National Park Service) mandates for their employment (Haas, 2001; Manning, 1999, 2007; National Park Service, 2006) suggests that more study is still necessary in evaluating the effectiveness of and need for social carrying capacities as well as the nature of crowding-related experience degradation. The presence of numerous studies incorporating perceived crowding and use limitation questions conducted by the Institute for Outdoor Recreation and Tourism (IORT) at Utah State University (USU) provided a useful existing source for data addressing these issues. Without the expense of collecting

new data on this number and range of types of respondents, existing data was available for analysis of these general research questions. Moreover, the IORT studies cover a broad geographic range of western North American outdoor recreation areas as well as a diversity of site types spanning extremely remote river-running settings, low-use but car-accessible frontcountry hiking trails, high-use fishing-oriented rivers, high use state park boating reservoirs, and even motorized recreation-oriented sand dunes.

While the individual surveys used by each study are not identical and vary in their effectiveness in addressing the research questions due to the divergent research needs initially motivating each study, it is hoped that the breadth of this reanalysis will serve to offset this drawback. In addition, in the original studies, survey responses related to these issues were analyzed to varying degrees, in many cases in only a cursory manner in the associated technical report, and no systematic side-by-side comparison of the survey data had yet been conducted.

Institute for Outdoor Recreation and Tourism (IORT)

The individual studies that make up this reanalysis were all conducted by IORT between 1999 and 2006 at the request of, and with funding from, the United States Department of Agriculture (USDA) Forest Service, the United States Department of the Interior (USDI) Bureau of Land Management (BLM), and the Utah Department of Natural Resources, Division of Parks and Recreation. IORT itself is involved in research, Extension, and education at USU. IORT specializes in the study of recreation and natural resource management, community development, and offers Extension services aimed at assisting decision making regarding the impacts of outdoor recreation-related tourism. In

addition, IORT offers both undergraduate and graduate courses along these lines (IORT, n.d.).

Study Areas

Utah Reservoirs and Lakes

Eight northern Utah reservoirs and lakes (seven reservoirs and one natural lake—Bear Lake State Park) were incorporated by intercept surveys conducted in 1999 and 2001. All are used primarily for relatively high density water-based recreation and are, in many respects, quite similar. Six are Utah state parks (Deer Creek, Jordanelle, Willard Bay, East Canyon, Hyrum reservoirs, and Bear Lake), while Pineview Reservoir is managed by the USDA Forest Service, and Echo Reservoir is managed for the Bureau of Reclamation by a concessionaire, Echo Resort (Reiter, Blahna, Redmond, & Bahr, 2002[a]; Reiter, Blahna, Tolman, & Bahr, 2000). As the Utah Division of Parks and Recreation was the agency funding these studies, they are hereafter referred to as *Utah state parks* studies. Popular activities include recreation with motorboats and personal watercraft (PWCs), fishing, non-motorized boating/sailing, waterskiing, and swimming.

In addition, telephone surveys conducted of registered Utah boat owners in 1999-2000 and 2006 are used in portions of this thesis research. These deal with many of the same types of Utah water-based recreation areas, though all Utah recreational water bodies are incorporated by the scope of the surveys (Reiter, Blahna, Smith, & Bahr, 2001[b]).

Mystic Lakes

This South Dakota study area consists of two water bodies: Sheridan Lake and Pactola Reservoir, located in the Black Hills National Forest. Both are managed by the USDA Forest Service and provide recreation opportunities similar in many ways to those of the Utah water bodies described above. Notably, these are the only comparable relatively large water bodies in the Rapid City, South Dakota area (Reiter, Blahna & Spleiss, 2002[b]; D. Reiter, personal communication, May 6, 2008).

South Fork of the Snake River

The South Fork of the Snake River is located in southeastern Idaho and managed for recreation by the BLM. The study incorporated a 39 mile segment located between Palisades Dam and the Byington boat launch. The majority of the segment is flat water with trout fishing providing its primary recreational draw. In addition, the area provides opportunities for hiking, camping, motorized recreation, and wildlife viewing (Reiter, Blahna, & Zimmerman, 2002[c]).

Utah Rivers

All Utah river site descriptions which follow are adapted from Reiter, Blahna, and Evans (2001[a]). This thesis incorporates data take from nine BLM managed river segments located in the eastern half of Utah. Primary recreational activities supported by these segments include rafting, canoeing, kayaking, and fishing. The northernmost river segment, the Brown's Park segment of Green River, is located between the Flaming Gorge Dam and the Brown's Park Bird Refuge. This segment is primarily used recreationally for trout fishing, and much of it is managed by the USDA Forest Service.

The Bonanza segment of the White River is largely flat water and stretches from the Colorado state line to its confluence with Green River on the Ouray Indian Reservation. Recreation is primarily river running.

The Desolation Canyon segment of Green River stretches from its confluence with the White River to Lower Grey Canyon. This segment lies in an extremely remote area and again, river running is the predominant activity. In Lower Grey Canyon, between Nefertiti Falls and Swasey's Rapids, lies the segment referred to in this study as the "Daily" segment. This relatively short river running segment incorporates class II and III rapids. The final segment of Green River, the Labyrinth Canyon segment, lies between Green River State Park and the boundary of Canyonlands National Park. This remote segment is used for river running.

The Westwater Canyon segment of the Colorado River is the most challenging whitewater segment included in this study. The shorter, so-called "Daily" segment of the Colorado River occurs just below this and is also used recreationally for river running, although its proximity to the popular outdoor recreation destination of Moab, Utah gives it a clientele who may be participating in various activities during their stay in and around Moab.

The San Juan River of southeastern Utah has been divided into an upper and lower segment, both of which offer river running opportunities.

Grand Staircase-Escalante National Monument Frontcountry Recreation Sites

The Grand Staircase-Escalante National Monument (GSENM) contains 1.9 million acres of land located in the extreme southern portion of Utah. The Monument is

managed by the BLM (it is the first National Monument to be managed by this agency). The character of GSENM is both remote and primitive. This thesis uses data from more accessible front country recreation sites located near or along roads and although these are more highly used than much of GSENM, they are nonetheless quite remote when compared to Utah reservoirs, for instance.

Common recreational activities include hiking, camping, scenic driving, visiting slot canyons, photography, viewing nature and wildlife, picnicking, rock climbing, off-highway vehicle (OHV) use, visiting historic sites, horseback riding, fishing, and mountain biking (Burr, Blahna, Reiter, Leary, & Wagoner, 2006).

Saint Anthony Sand Dunes

The Saint Anthony Sand Dunes (SASD) are located near St. Anthony and Rexburg, Idaho, in the eastern part of the state. The dunes are managed by the BLM and contained within a larger Wilderness Study Area as well as incorporating Special Recreation Management Area devoted to motorized recreation. While motorized/OHV use is the primary recreation activity supported by the SASD, the area also draws horseback riding, hiking, camping, hunting, photography, antler collection, rock hounding, sledding/tubing, and bonfire-centered recreation (Wagoner, 2006).

Research Objectives

The primary objective of this thesis research is to identify the degree to which use levels or encounters with other parties affects respondents' perceptions of crowding. This is of interest in both an absolute sense and in relation to other factors that may affect

such perceptions. Such factors will be drawn from the literature on the subject and incorporated into this thesis research where they are available in the individual studies that comprise this project.

In addition to this, a second objective is to conduct a similar evaluation of survey respondents' opinions about the desirability of use limits and the factors (among them respondents' crowding perceptions) that contribute to these responses. This is pertinent due to the interconnectedness of perceived crowding and carrying capacity concepts in the outdoor recreation literature, as well as carrying capacity/use limitation's use as a remedy to managers' perceptions of crowding problems at recreation sites. Identification of the degree to which public support for such limitations is connected to visitors' crowding perceptions, as well as other factors, is therefore desirable in assuring managers consider all potentially effective tools available. For example, if many visitors support use limits due to conflicts between incompatible uses, perhaps other options, such as spatial zoning, should be considered.

In order to fully contextualize research questions that have, according to critics, become myopic in their focus on a single management action, in addition to highlighting a potentially isolated and relatively minor problem, three other research questions will be incorporated. First, the correlation between perceived crowding and overall use satisfaction will be investigated. Also, open-ended responses giving reasons for user dissatisfaction will be investigated to identify the relative frequency of crowding as a stated cause of dissatisfaction.

Second, the proportion of respondents reporting they would go elsewhere if denied entry to the study location due to use limits will be identified. This will serve to

evaluate the potential for use dispersal that may simply displace social impacts from one site to another (Blahna & Reiter, 2001; McCool & Cole, 2001).

Lastly, reasons for visitors' support for use limits will be further investigated using qualitative, open-ended survey data. It is hoped this may more directly suggest reasons for recreationists' support for rationing.

CHAPTER 2

REVIEW OF LITERATURE

The literature review focuses on four overall areas of past research. First, the interrelated issues of perceived crowding and social carrying capacities are discussed in some depth. Second, due to the degree to which recreational conflict is involved in the thesis research objectives, pertinent literature on recreational conflict is described. Third, recreation experience preference (REP) scales are briefly described as these are used in several component surveys to assess recreationists preferred experience characteristics and what might be termed "motivations" for specific recreational activities. Finally, the research questions asked by this thesis project are described from a theoretical perspective based upon the reviewed literature.

Crowding and Carrying Capacity

One of the earliest and most influential papers on carrying capacity and crowding comes from Wagar (1964). While much of the paper concerns biophysical impacts of recreational use, social crowding concepts are also emphasized amongst the potential impacts of high recreational use levels. Wagar touches on several related themes that later became important in the perceived crowding and use density/visitor satisfaction literature. First, he identifies that outdoor recreation participation is motivated by multiple "needs and desires" (p. 6) in various users and for various activities. Some of these, such as a desire to achieve *solitude*, may be negatively affected by certain densities of visitation.

Along with this, Wagar identifies implementation of carrying capacities as appropriate for some recreation sites given clear management objectives. Use limitation is, thus, merely a means to an end and is not appropriate for dealing with all sites as later mandated by the National Park Service (NPS) (Haas, 2001; NPS, 2006). In addition, Wagar states that evaluation of the tradeoff in costs and benefits of providing more pristine, low-use recreation areas and restricting access is a matter of management judgments.

Later, Wagar (1974) backed away from the concept as an effective management strategy altogether. In his later article, Wagar focuses on the social aspects of the theory's application, suggesting the term *carrying capacity* distracts managers from management actions other than use limitations and moreover, can tend to prevent the establishment of specific management objectives. Expanding on a theme of his 1964 article, Wagar advocates the establishment of zones within larger areas so as to provide the diversity of recreational opportunities sought by visitors with varying motivations. In addition, he proposes evaluation of management success over a larger geographic area, on "the relation of each area [site] to many others" (1974, p. 274), rather than focusing on gains and losses at specific sites.

The concept of crowding (though not in outdoor recreation settings) has also received attention from the social-psychology literature. For example, Altman (1975) conceptualizes crowding as a system in which individuals are unable to adequately regulate interpersonal contact. It is a "motivational state" (pp. 150, 156) of psychological and/or physical stress in which an individual seeks to free him/herself from unwanted social contact. This is achieved through various "coping behaviors" (p. 158). Thus,

crowding perceptions are presented as a feedback loop in which individuals successfully or unsuccessfully deal with stimulus.

Altman distinguishes three types of crowding. The first, *intrusion* is an almost territorial response to perceived violations of group or individual space or area of control. *Social interference* refers to interruptions of activities due to sources outside the activity. *Blocking of access* refers to the inability to obtain or use a given resource due to physical prevention by sheer numbers of others. Altman adds the component of *duration* as a pertinent aspect of the analysis of crowding; crowding, or the stress it causes, is perhaps less severe in situations that quickly pass than is the case under long-term conditions.

Schmidt and Keating (1979) identify the predominance of factors outside of numerical density in causing perceived crowding. While the relationship between "absolute density" and crowding is described as "inconsistent," the relationship with "functional density" is more consequential (pp. 695-696). Thus, density becomes important when it begins to interfere with individuals' actions. Central to the complex relationship between density and crowding is the concept of perceived loss of "personal control" (p. 686). As the authors highlight the importance of interference with, or blockage of goals as a primary contributor to situations that will be labeled "crowded," an implication regarding outdoor recreation crowding perceptions can be drawn here: the susceptibility of recreationists to recreational crowding is likely to be dependent on their specific recreational motivations and goals.

Also, Schmidt and Keating discuss *stimulus overload* as a cause of crowding perceptions. This occurs when the density of social interactions and stimuli overcome individuals' ability to process information adequately. This seems to be associated with

very large numbers of people and/or enclosed areas, as well as in situations in which some degree of interaction with the setting and others was necessary.

Central to Schmidt and Keating's discussion is the importance of the perception of control. Perceived crowding is generally seen as a direct result of an individual's loss of control over their situation or immediate environment through avoidance, psychological coping mechanisms, or the ability to end unwanted stimulation. When these mechanisms of coping or control fail, crowding perceptions begin.

Temporal factors important in crowding perceptions are also identified in this article. It may be noted that this factor has most often been absent from studies in the outdoor recreation management literature. In other words, the time at which interactions occur, or perhaps more importantly, their duration may be as or more important than the number of encounters.

In sum, the social-psychology literature reviewed suggests a relationship between social densities and individuals' ability to behaviorally or psychologically regulate interaction with, or exposure to others in various settings. Crowding occurs when individuals lose the ability to control these factors. Again, Altman and Schmidt and Keating refer to urban/rural social settings and do not deal directly with the need of certain individuals to achieve *solitude* (though they do consider a similar concept, *privacy*). It is unclear how much psychological difference is present between the social psychology of these situations involving daily life and of those involving outdoor recreation pursuits. It is important to note that the crowded situations discussed in this literature lead to real physical and psychological stress, whereas the outcomes for

respondents in outdoor recreation surveys related to perceived crowding might best be characterized as annoyance or frustration, in general.

Some of the early empirical research into recreational crowding and carrying capacity was conducted by Stankey (1973), who investigated both hypothetical crowding situations and actual measurement of perceived crowding, as well as favorability of recreationists towards use rationing/limitation. As it was conducted in a wilderness setting, one interesting aspect of this study was the classification of respondents based on an index of "wilderness purism." Stankey measured respondents' similarities in attitudes and recreation aesthetics to the definition of *wilderness* found in the 1964 Wilderness Act with its stated purpose of providing solitude and essentially pristine natural areas. Results from the four wilderness areas studied suggested respondents tended to have an aversion to hypothetical encounters. This was especially true of stronger wilderness purists. Also, the number of respondents hypothetically reporting a "pleasant experience" declined rapidly given increasing hypothetical encounters. The negative impact of hypothetical encounters increased when these encounters were with parties engaging in conflicting uses (e.g., canoeists encountering motorboat users or hikers encountering horseback riders). Throughout, respondents were more likely to report negative effects with increasing use and be favorable to limitations as wilderness purism rating increased.

Party size was found to have detrimental effects on experience in hypothetical survey questions, as well. Respondents tended to prefer more encounters with small groups to a single encounter with a large party. Users were also willing to accept more encounters in the perimeters of wilderness areas than in interior areas. Reaction to

hypothetical use limits was mixed but respondents were somewhat more favorable towards indirect than direct limitation techniques (i.e., more favorable to measures such as eliminating roads to wilderness boundaries than to implementing permit systems).

When asked about actual perceptions of crowding, about 25% of respondents reported crowding. This varied considerably between areas, between types of use, and between different areas within each wilderness. Stankey notes that crowding perceptions are influenced by the type of use encountered, as described in the hypothetical crowding questions. Responses to both hypothetical and actual perceived crowding questions varied based upon the types of use engaged in by respondents.

In discussing use management implications, Stankey generally identifies a need to disperse use from points of concentration that seem to cause crowding perceptions. He also cautions managers against seeking objective, scientifically derived carrying capacities for wilderness areas and stresses the need for these to come from managers' judgments. Additionally, Stankey writes of the inherent difficulty in evaluating tradeoffs between management actions meant to alleviate crowding but which may also violate the spirit of the Act in its provision of "unconfined," spontaneous recreation experiences. It is also important to note that a negative relationship between wilderness encounters and overall satisfaction is considered valid, though it is based only on respondents' answers to the hypothetical use level questions.

Schreyer and Roggenbuck (1978) discuss the issue of social carrying capacity from a general perspective (i.e. not wilderness-specific), though the study area in Dinosaur National Monument is described as "de facto wilderness" (p. 380). Theoretical underpinnings of their study focus on *expectancy* and *discrepancy* theories. The former

social-psychological theory posits that individuals engage in activities with the expectation of realizing specific outcomes, while the latter describes satisfaction with an experience as contingent upon perceptions of the experiential outcome matching preconceived goals or desires.

Schreyer and Roggenbuck surveyed river runners, first classifying respondents in three groups based on the degree to which their attitudes matched the text of the Wilderness Act, in a somewhat similar manner to Stankey (1973). The percentage or number of respondents falling into each group is not reported. *Experience expectations* were measured using a precursor to the standardized *Recreation Experience Preference* (REP) scales developed by Driver and others (Manfredo, Driver, & Tarrant, 1996). Of these *experience expectations, action/excitement* was most important with *learning about nature* second, and *stress release/solitude* "a distant third" (p. 384). (REP scales are further described later in this chapter.)

Respondents were asked to estimate the number of other people seen on their overnight trip. Overall, approximately half of respondents felt use was at an appropriate level, while one third thought they had seen too many others. A clear positive association was shown between numbers of estimated encounters and the percentage of respondents reporting perceived crowding. A distinct relationship was also observed between the rating of the *stress release/solitude experience expectation* construct and perceptions of crowding, especially with higher estimated numbers of encounters. The *self awareness* construct showed a similar relation with crowding perceptions, though estimated use levels had less effect. Statistically significant differences did not appear with other constructs. Similarly, respondents in the top wilderness attitudes category showed

consistent and substantially higher crowding perceptions than others, especially at higher estimated use levels, where 86% thought use was excessive.

Based on the results, Schreyer and Roggenbuck caution managers against managing for average visitors and instead to clarify management objectives and manage sites for recreational experiences and thereby manage for visitors seeking that experience.

Nielsen, Shelby, and Haas (1977) describe satisfaction as a "multidimensional" (p. 572) concept which is exceedingly hard to measure meaningfully. Nielsen et al. focus on wilderness recreation specifically. They advocate the addition of an intervening variable, *perceived crowding,* that mediates between numbers of encounters and the elusive and complex concept of satisfaction. Moreover, they mention the commonality of very high reported satisfaction levels across sites with wide variations in overall use levels. This seems to indicate an inherent problem with discerning a relationship, if any exists, between use levels and satisfaction.

In explaining this, Nielsen et al. (1977) hypothesize that crowding thresholds are defined by visitors based on their first visit(s) to a recreation site. Increasing use levels are likely to displease repeat visitors and, it follows, they will be displaced to other, more favorable recreation sites. Thus, respondents to recreation surveys are likely to be first time visitors or those not yet with sufficient crowding perceptions to displace them to alternate recreation sites. The authors refer to this as the *last settler syndrome,* and propose it as a potential explanation for uniformly high satisfaction levels across varying use densities.

Using existing data from a University of Arizona research project encompassing large changes in use level of the Colorado River in Grand Canyon National Park, Nielsen

et al. found that variables measuring the ability of respondents to escape from a variety of aspects of civilization was not correlated with use-level. While more recent users had statistically significantly more negative reactions to use level, its magnitude was "hardly large enough to be important" (r = -.09) (p. 576). The data lent more weight to crowding and satisfaction being unrelated. The authors assert, however, that this *last settler syndrome* has some validity and implications for management actions.

In responding to criticism of methodological issues in the measurement of visitor satisfaction in a carrying capacity context from Greist (1976), Heberlein and Shelby (1977) also note theoretical problems with basing capacities on visitor satisfaction due to this lack of variation in satisfaction levels over widely varying use densities.

The results of Manning and Ciali's (1980) study of river recreation also show a distinct lack of correlation between use density and satisfaction. They describe a model of recreation satisfaction wherein density, mediated by crowding, leads to dissatisfaction. Their study incorporated four Vermont rivers with multiple types of recreational use. The relationship between use density and satisfaction was tested both hypothetically, as was done by Stankey (1973), and in terms of observed densities. Even when the sample was broken down by types of recreational use, no negative correlation between actual use density and satisfaction was observed (in fact a weak positive correlation was present). Hypothetical results, however, showed a strong decrease in satisfaction with increased use after an inflection point at approximately five encounters.

In studying a campground in Katmai National Monument in Alaska, Womble and Studebaker (1981) found a statistically significant relationship between crowding and satisfaction but one with a correlation that was low (r = -.27). They not that open-ended

comments suggest bad weather may be the most important factor detracting from visitors' experiences.

In addition, the authors compared use density, preferences regarding density, and expectations regarding density with crowding perceptions. The correlations here too are "modest" (p. 562) with use density itself serving as the weakest explanatory variable, and preferences for density the strongest. Together, 45% of the variation in perceived crowding was explained by these three variables. It should be noted that at the surveyed campground, different groups of campers were required to share campsites much of the time. Also, many of the qualitative response data collected emphasized negative reactions to specific behaviors of other campers, as well as the inability of the facilities to accommodate use densities rather than objections to the use density itself.

In his synthesis of existing research into outdoor recreation crowding, Gramann (1982) again notes the overall lack of meaningful correlation between encounters/use densities and visitor satisfaction throughout the outdoor recreation literature. He discusses the common criticism leveled against use of *satisfaction* as an indicator due to its makeup of many complex components, and its corresponding insensitivity to variation in individual factors that may contribute to it (e.g., crowding).

Gramann (1982) approaches the issue using the two "dominant" social-psychological crowding theories: *stimulus overload* and *social interference,* described previously in the discussions of Altman (1975) and Schmidt and Keating (1979). He relates *stimulus overload* to recreation theories using the importance visitor expectations of use densities to perceptions of crowding. In essence, individuals control their exposure to social stimulation by choice of recreation location based on knowledge about

probable use levels. When expectations are violated, individuals may lose this control and experience crowding. *Social interference* is related to recreational crowding through crowding-related blockage of recreational goals. Thus, goals related to desires to experience solitude may be interfered with via use densities incompatible with this goal.

Gramann (1982) also distinguishes between *physical crowding*, where use densities interfere with "perceived spatial requirements," and *psychological crowding*, where there is a perception of use densities interfering with "psychological goals" (p. 113). Within *psychological crowding*, he further distinguished between *density effects* and *behavioral effects*, with the former depending on numbers of other visitors and the latter due to negative reactions to specific behaviors.

Ditton, Fedler, and Graefe (1983) again describe the distinct lack of meaningful correlation between density and satisfaction. They note that this has led to broader use of perceived crowding itself as a dependent variable instead of satisfaction. Their study of Buffalo National River floaters lends credence to the importance of the social-psychological aspects of crowding described by Gramann (1982).

Ditton et al. used a survey instrument that asked respondents whether encounters detracted from, added to, or did nothing for their overall experience. Of the 22% of respondents reporting decreased enjoyment, most reported only a slight effect. Seventy-eight percent of respondents did not report any reduced enjoyment as a result of encounters with others, with 27% of these respondents actually reporting increased enjoyment due to encounters. Items positively correlated with crowding were experience level, frequency of visitation/use, visitor-estimated and measured use densities, and several *experience expectations* (derived from the REP scales discussed previously).

Among these were “getting away from people” and “experience peace and solitude.” It is also interesting that a statistically significantly greater proportion of crowded visitors also reported other problematic elements of their trips.

Shelby, Heberlein, Vaske, and Alfano (1983) also investigated several of these factors in relation to crowding perceptions using six studies of river recreationists and hunters. Regression analyses were conducted using estimated or empirically measured contacts, expected contacts, contact-related preferences, and perceived crowding as the dependent variable. Between 5 and 19% of the variance in perceived crowding was explained by the independent variables. Three of six studies did not have a statistically significant coefficient for numbers of contacts alone. The coefficients for contacts were statistically significant and large at all sites in models incorporating all three independent variables, however. All independent variables were statistically significant in at least some of the component studies with contact preferences being the weakest variable.

Due in large part to the ubiquitous lack of variation in visitor satisfaction with differing use densities, studies have begun to focus on perceived crowding itself as the main dependent variable of interest (Graefe, Vaske, & Kuss, 1984; Manning, 1999; Shelby & Heberlein, 1984, 1986). Haas (2001) has described the use of perceived crowding as a variable as a “surrogate or proxy measurement for satisfaction” (p. 8).

It should be noted this lack of correlation between use level and satisfaction has not been interpreted as an indication of a lack of pertinence for crowding research but instead generated various explanations (e.g., Ditton et al., 1983; Manning & Ciali, 1980; Shelby & Heberlein, 1986). Shelby and Heberlein (1986) summarize much of this when they describe the consistent lack of correlation between use levels and satisfaction as

"counterintuitive" (p. 55) and propose five, sometimes related explanations for this. First, they note that outdoor recreation is inherently self-selecting with visitors opting to engage in recreational activities they enjoy at favored locations. Second, they describe recreational *product shifts* wherein recreationists may re-prioritize recreational goals relative to encountered situations in order to avoid the realization of a dissatisfying experience. Third, they suggest displacement of users as a result of perceived crowding, as crowding-sensitive visitors move to different areas and are replaced by those who are more accepting of higher density experiences. Fourth, they mention the complexity of *satisfaction* and the many factors that contribute to it. With so many different aspects comprising it, variation in satisfaction is difficult to measure with changes in any single variable. Fifth, they describe *rationalization* of recreation experiences where visitors focus on positive aspects and tend to ignore those that would be negatively evaluated.

In their study of the relationship between use density and perceived crowding, Absher and Lee (1981) describe the relationship between these two variables as having "at best only moderate levels of association" (p. 232). Thus, even the variable meant to mediate between satisfaction and use density is does not seem to fully bridge this gap. Absher and Lee propose the addition of further variables to explain perceived crowding. In the authors' path analysis model derived from respondents in the backcountry of Yosemite National Park, the relatively weak—though statistically significant—relationship between use level and perceived crowding drops below the statistically significant level when other variables are added to the model. These are: motivational variables (precursors to the REP scales) and visitor characteristics such as respondents' length of visitation to the area and demographic factors. The motivational factors are a

far bigger factor in this relationship. Important variables are desire for "quietude," "nature involvement," and "shared experiences." The desire for "quietude" shows a positive relationship with respondents' level of perceived crowding, while the other two motivations show negative relationships—i.e., respondents with stronger motivations for these are less inclined to be crowded.

The variables for user characteristics were important only in their effect on the motivational variables described above. This was primarily an effect of the collinear length of experience in the study area and age variables. In contrast to the hypothesized recreational *last settler syndrome* (Nielsen et al., 1977), Absher and Lee find length of experience to be negatively related to desire for "quietude," which is positively related with perceived crowding. The overall R^2 value was .26, while the R^2 value for the correlation between use level and perceived crowding alone was .07.

Shelby and Heberlein (1986) use five studies encompassing several different recreational activities. The studies used a survey instrument identifying crowding on a nine-point scale ranging from "not at all crowded" to "extremely crowded." All but one category (Grand Canyon rafters) show statistically significant correlations between use levels and perceived crowding, explaining between 1.5% and 32.5% of the variation in the perceived crowding dependent variable. These studies also examined the effects of other mediating variables similarly to Absher and Lee (1981), Ditton et al. (1983), and Shelby et al. (1983). Various measures of overall encounters were not statistically significant. The number of *attraction sites* where visitors encountered others, encounters at *attraction sites*, and the multiple correlation measure for this part of the model were statistically significant but weak in terms of magnitude ($R^2 = .04$). More important were

preferences and expectations regarding encounters, which raised the cumulative R^2 to .29, and perceptions of biophysical impacts (cumulative R^2 = .53).

Shelby and Heberlein note the relative importance of factors other than use numbers are a problem for perceived crowding studies. The inability of managers to identify clear points at which crowding becomes problematic is seen as a justification for adopting a normative approach to crowding and carrying capacity studies. Shelby and Heberlein (1986), as well as Vaske, Shelby, Graefe, and Heberlein (1986), state that social norms regarding proper use levels can be identified through user preferences and thus be used by managers to make appropriate carrying capacity decisions. This approach is dependent upon identification of shared beliefs about "appropriate" number of other visitors for a given site (Shelby & Heberlein, 1986, p. 74). While in many contexts norms are well established, such as formal rules for sports, in outdoor recreation, the authors assert, research is needed to set standards. "Reasonable consensus often exists and there are ways to explore this empirically" (Shelby & Heberlein, 1986, p. 75).

Shelby and Heberlein (1986) propose plotting mean favorability ratings at varying hypothetical use levels in order to establish graphical curves detailing social encounter norms. The portion of the curve above the neutral point is termed the "range of tolerable contacts" (pp. 77-78). This tolerable range can then be used to set carrying capacities. They note the *crystallization* (i.e. the level of consensus) of a norm can be measured by dispersion around the means.

Roggenbuck, Williams, Bange, and Dean (1991) question whether the objects of study via this methodology are in fact *norms*. For one thing, the number of respondents giving unsure or "does not matter" responses to crowding norm questions is unclear in

many previous studies, and this may imply a lack of actual crystallized norms. In the study of rafters on the New River Gorge National River in West Virginia undertaken by Roggenbuck et al., only in the wilderness setting did more than half of respondents give actual numerical opinions about acceptable use levels.

Previous normative crowding studies have indicated greater crystallization in low use, backcountry-type settings (Shelby & Vaske, 1991). Roggenbuck et al. (1991), however, take issue with the measure of dispersion used (standard deviation) and suggest instead use of a coefficient of variation. Using this they find no increase in low use area crowding norm crystallization. Sheby and Vaske (1991), though, find coefficient of variation to be a theoretically inappropriate measure of norm crystallization.

In their study, Roggenbuck et al. (1991) found an overall lack of crowding norms and a dearth of consensus that would make this normative research inappropriate for use in setting carrying capacities or other management actions in their view. They also note several shortcomings in the operational definition of *norm* used in recreation research relative to some definitions of the term. The measures used, they contend, record "affect—a feeling of pleasantness or unpleasantness" (p. 136), rather than actual norms.

Shelby and Vaske (1991) contend that norms in an outdoor recreation context are in a formative stage and that Roggenbuck et al.'s results are easily interpreted to show some degree of norm crystallization amongst backcountry rafters. They also note the degree of debate over the definition of *norm* within the broader social-psychological literature.

In their analysis of thirteen recreation surveys in the United States and Canada, Vaske and Donnelly (2002) asked respondents for the highest number of encounters per

day that they would consider acceptable. This is seen as another method of identifying crowding/encounter norms. The survey also asked participants to rate perceived crowding on a 9-point scale. Seventy-three "evaluation contexts" (p. 258) were identified consisting of respondent participating in each specific use type evaluating each use types encountered in the 13 studies. Across these, 66% of respondents reported encounter numbers lower than their norm while in 34% of cases, norms were exceeded. Overall, respondents encountering use levels below their stated norm had a mean crowding score of 2.02, while those above had a score of 4.01, "'Slightly' to 'Moderately' crowded" (p. 264). In one evaluation context, all respondents reported fewer encounters than their stated norm and comparisons between crowding scores for those whose norms were and were not exceeded could therefore not be analyzed. In 67 of the other 72 evaluation contexts, a statistically significant difference was observed between crowding ratings for those whose norms were exceeded and those for whom encounters were fewer than their maximum acceptable level. Twenty-nine studies found r values for this correlation greater than .5, 35 had r values between .5 and .3, and eight had r values of less than .3.

The findings of Cole and Stewart (2002) bring the precision and validity of crowding norms-based studies into question. The authors, in fact, choose to refer to "standards" instead of "norms." In their study of backcountry users in Grand Canyon National Park, individual, temporal, and spatial disparities in the standards given by respondents are analyzed. This study had the advantage of querying visitors about acceptable use levels at several different points in time. The study area is zoned spatially based on the degree to which each zone is primitive or remote. Statistically significant differences were found between all zones. Differences were not found between use

types. Except in the most primitive, *wild* zone of the study area, respondents did not provide consistent answers each time they were asked. In all zones acceptable standards increased statistically significantly each day with numbers of reported encounters. This explained 18% to 26% of the temporal variation in responses, implying other factors also affect reported crowding standards. Cole and Stewart suggest that "personal standards may be affirmations of current conditions more than judgments about what ought to be" (p. 323).

Manning, Lime, Freimund, and Pitt (1996) approach the issue of crowding norms in a slightly different manner. They place the importance of identification of crowding norms in the context of setting "standards of quality" (p. 41) for site evaluation within management planning frameworks. With the primary importance of previous norms research focused on backcountry use, where more potentially meaningful or crystallized "norms" or attitudes were identified (Shelby & Vaske, 1991), Manning et al. propose the use of visual approaches to identifying frontcountry crowding norms. Here, photographs displaying varying use densities are used to obtain respondents' opinions and, theoretically, identify norms regarding frontcountry use levels. This, they maintain, can overcome weaknesses of numerical approaches to identifying norms in these settings.

For this initial study, Manning et al. (1996) used photographs of Delicate Arch in Arches National Park showing varying numbers of people in varying placements to identify acceptability of each. Findings showed decreasing acceptability with increasing use density, with foreground placement of individuals eliciting a greater negative reaction. Instead of simply using measures of dispersion, crystallization of this norm is here measured by analysis of variance, essentially comparing the statistical explanatory

power of the independent variables and the error. Results are statistically significant. The "minimum standard of quality" (p. 50), which is the level at which the curve of mean ratings crosses from acceptable to unacceptable, was determined to be 28 visitors. Respondents who were estimated to have encountered use levels greater than this "social norm" and reported some degree of crowding, along with those who had encountered numbers below this and reported no crowding, made up 74% of respondents.

Numerical assessments of crowding norms were also derived based on the approach detailed in previously described crowding/encounter norms studies without use of photographs. These questions about the appropriate number of other visitors yielded a mean acceptable encounter level of 16.8 other visitors, compared to the 28 person standard derived through the visual approach.

This line of visual estimation of crowding norms has remained prevalent up to the present. Manning (2007) details numerous studies using similar methodology.

Despite the entrenched position of crowding and carrying capacity research within the outdoor recreation literature, procedures, and policy (Manning, 1999, 2007), the relevance of these concepts, as well as their application have been criticized (e.g. Borrie et al., 1998; Burch, 1984; McCool & Lime, 2001; More, 2002). These negative evaluations raise very pertinent questions about carrying capacities, the nature of crowding, and whether or not these concepts deserve such primacy for use as management tools.

In early criticism of the carrying capacity model, Becker et al. (1984) characterize the line of research as a search for a "technical solution" to a "subjective question." "For a technical/computational solution to occur… a high level of concurrence on social

values and on scientific fact is needed" (p. 478), they write. In other words, social carrying capacities are criticized when used in the context of giving managers objective answers about what conditions should be as opposed to use as a means of reaching a clearly identified end. They are specifically critical of capacity decisions made in the absence of any evidence of connection between use levels and perceived crowding.

Burch (1984) goes further, stating that "never has so much been said about by so many about a topic of such inconsequential irrelevance" (p. 488). He places the blame for the fixation of the outdoor recreation management field on crowding and carrying capacities on a need of managers to control situations rather than use them as an opportunity to gain greater insight. This type of study, he asserts, is merely a justification and "rationale for a priori management decisions" (p. 488). He is critical of both the concept that such study can identify ideal management goals and thus preclude managerial judgments and the focus on limitation with a tendency to see recreational use as a *problem*. He asserts that the apparent fixation on carrying capacity may distract from other, possibly more useful management actions.

Moreover, Burch (1984) criticizes carrying capacity studies on the grounds that they are not comprised of the testing of any actual "social science theories." "In short," he states, "we have a large amount of research driven by a poorly understood concept whose main function is to help managers control something they do not understand" (p. 489).

One piece of early criticism from a study by Lee (1977) also specifically brings into question outdoor recreation researchers' understanding of crowding and wilderness recreation social behaviors. This stems from Lee's observation of similar leisure

behavior characteristics at both urban beaches and designated wilderness areas, as well as the hypothesized and observed lack of association between visitors' crowding perceptions and actual behaviors employed in response to, or as a means of avoiding, crowding. The study was conducted in a variety of wilderness settings within Yosemite National Park and made use of both various verbal and non verbal greeting responses to trail encounters, observed characteristics of campsite choice, and questionnaires recording respondents' crowding perceptions. No statistically significant relationship was revealed through chi-square analyses of crowding perceptions in relation to both reactions to encounters on trails and the prevalence of behaviors intended to avoid crowding at campsites. Thus, actual behaviors were independent of survey responses intended to assess perceived crowding.

Lee states, "The paradox of social behavior in wilderness exists only if we accept unquestioningly the notion that wilderness users withdraw from social interaction to achieve privacy" (p. 7). He concludes that survey responses from wilderness recreationists are of questionable validity and that the respondents seem to lack understanding of their own recreational behavior. In this conclusion, the author draws corollaries with other areas of sociology, asserting the need for future research to take a more complex view of these social aspects of leisure and recreational behavior. Lee concludes the nature of social interaction in this wilderness context can be characterized as "nonsymbolic communication" (p. 15) which is, in essence, constituted by interactions requiring any conscious analysis by participants. This is typified by the types of socially habituated greetings or acknowledgments measured as part of this study. Therefore, Lee concludes "the 'quality' of the recreational experience appears to be closely linked with

the opportunity to take for granted the behavior of other visitors" (p. 16) as he had previously observed at the setting of urban beaches. This is based upon visitors' perception that other visitors are similar to themselves and engage in comparable types of behavior.

More (2002) raises broader social questions about carrying capacities and use rationing. From a social equity standpoint, he notes the potential of lottery and permit system waiting lists to disproportionately limit access for poor and working class individuals due both to the lack of ability to navigate bureaucratic systems and lack of work/vacation flexibility. More also states access—and thereby a connection to public lands and the natural environment—is profoundly important in fostering broad public support for the protection of natural areas.

Haas (2001, 2003, 2007) echoes some criticisms of the ability of crowding/carrying capacity studies to provide a substitute for managerial judgment calls but comes to a very different conclusion about the role of "visitor capacities" in outdoor recreation management. He maintains setting visitor capacity is crucial to recreation management, though it should be used as a management judgment of the ability of an area to accommodate use. These judgments should be set based on multidimensional social and biophysical criteria, seen together, not as separate social and ecological capacities. He asserts that "one does not *determine* capacity but rather *decides* upon it" (Haas, 2001, p. 4, emphasis added).

Haas (2001, 2007) is also careful to differentiate between visitor capacities and use rationing/limitation. A capacity, he maintains, is an indicator or standard of quality while rationing is a management action meant to address problems.

Becker et al.'s (1984) critique of recreation carrying capacity touches on the potential of planning frameworks that place site-specific management actions and goals into a "regional context" (p. 482). This, the reader may recall, is similar to Wagar's (1974) suggestion that managers remain conscious of the relationship of sites to one another in a larger geographic context. Schreyer (1985) expanded on this theme with his conceptual article on managing river recreation as an overall system. Thus, different opportunities for recreation experiences can be provided on different river segments within the larger system, as opposed to managing each segment in isolation and making decisions based on the opinions of a supposed majority of users.

Borrie et al. (1998) connect the dominance of carrying capacities as a management focus to a preoccupation with controlling use levels at the expense of other management actions and goals. They again specify the importance of specifically written management judgments about desired conditions. Carrying capacities are only a valid management action when management goals are directed at protecting density-dependent uses or users. The authors also caution managers on the propensity for use limits to merely displace impacts from one site to another rather than actually alleviating them.

Other articles criticizing crowding/carrying capacity research in its tendency to focus on individual sites rather than taking a regional perspective include Blahna and Reiter (2001), McCool and Cole (2001), and Cole (2000). With high-use areas more likely to receive carrying capacities and use rationing (Cole et al., 1997), managers may be attempting to reduce perceived crowding in those visitors least likely to report it in the first place. In Blahna and Reiter (2001) (this paper was written using data incorporated into this thesis research), users in high-use areas were actually shown to be less likely

than those in low-use areas to report crowding. Thus, more direct management actions may be imposed in areas where users are largely satisfied with use levels, and because of this, some of these users may be displaced into lower use areas, possibly even creating crowding issues for other more sensitive recreationists.

McCool and Cole (2001) refer to this process as a trend towards "homogenization and suboptimization" (pp. 85-86), wherein the variety of social environments for outdoor recreation is reduced and those areas that provide solitude experiences are degraded. Because of this, a management perspective incorporating multiple sites used for the same or similar primary recreational activities into a system may be superior for many outdoor recreation areas. Geographic areas incorporating all relevant alternative sites for specific activities allow for informed decision-making regarding appropriate ranges of site attributes and reduce the possibility of simply relocating management concerns from one site to another.

In a specifically frontcountry application, Gramann and Burdge (1984) investigated crowding perceptions at Lake Shelbyville, a high use, fully developed reservoir in Illinois. Through multiple regression analysis, the authors found meaningful, statistically significant correlations between perceived crowding and three independent variables: respondents' age (older respondents were less likely to report crowding), whether they had brought a boat (boaters were more likely to report crowding), and whether they had encountered objectionable behavior in other users (this raised the likelihood of reporting crowding). Crowding responses were a compound measure of both respondents' perceptions of "overcrowding" and "traffic congestions." Use density was measured as a ratio of U.S. Army Corps of Engineers (CoE) estimates of use levels

and capacities of recreation sites, based on the period when respondents were at the reservoir. Interestingly, this measure was not statistically significantly related to crowding. The authors caution that this may be due to CoE estimates being taken on land, not the lake surface, though 59% of respondents did not bring boats and thus recreated solely from the shore. Nevertheless, this result is of interest, especially given the reservoirs similarity to several of the IORT study sites used in this thesis research. In addition, no motivational recreation experience preferences (REP) factors were statistically significant (see section on REP below), nor were other demographic measures. The lack of statistical significance in motivational/REP categories was not surprising to the authors who hypothesized in frontcountry settings, physical crowding and behavioral crowding would be more profound sources of crowding than goal interference or social interference. The recreational goals, such as *solitude* and *escape*, as represented by REP constructs, were rejected as substantial contributors to visitor perceptions of crowding.

In another study of high-density outdoor recreation, crowding at low levels, along with four other low-level impacts were investigated by Noe, Hammitt, and Bixler (1995) at three eastern NPS units: the Blueridge Parkway, the Chattahoochee River National Recreation Area, and the Chickamauga and Chattanooga National Military Park. Uniformly low impact levels were used to control for impact severity while testing respondents' perceptions of these in varying locations. Crowding impacts were found to be the type of impact "of least concern to the majority of user groups" (p. 329). Respondents found this level "slightly acceptable" (p. 329) in all studied locations within the parks with no substantial variation. Respondents were grouped via cluster analysis

based on their attitudes towards National Parks and the environment as a whole. Here, a group deemed "preservationists" (p. 335) by the authors emerged for whom crowding was considered "slightly unacceptable" (p. 334), though only in trail settings.

Cole, Watson, Hall, and Spildie (1997) investigated crowding at six "high-use destinations" (p. 2) in wilderness areas within the Cascade Mountains in Oregon and Washington. Overall, most visitors reported that encounters did not detract from their experience and even at the area with the highest perceived crowding rating, only twelve percent felt encounters "detracted a lot" (p. 18). Perceived crowding, rated on a ten-point scale, had a relatively low mean ranging from 2.6 to 4.3. Responses regarding expectations about use levels all had median answers that indicated conditions were as expected. Majorities in all areas saw either as many as or fewer than the number of other visitors they expected. Most users also reported their trip was "more enjoyable than most wilderness trips" (p. 22).

Most respondents' were favorable towards use limits, but most also thought current levels were not high enough to justify limits. Only between ten and twenty percent supported an actual reduction in use, depending on study area.

This study is particularly interesting due to the relatively low levels of social impacts incurred by extremely high-use areas within designated wilderness. The authors reflect on the levels of use reductions necessary to achieve a meaningful reduction in crowding impacts and conclude the large-scale displacement of users to other areas, as well as the impact of denying individuals access, would not justify the modest reductions in perceived crowding (and biophysical impacts) that could be achieved.

Stewart and Cole's (2001) study of backcountry hikers at Grand Canyon National Park is particularly pertinent to this thesis research. The authors' analyzed relationships between several variables similar to, or the same as, those used in this thesis research. Stewart and Cole measured *experience quality* (similar to overall satisfaction as used in many early studies), *perceived crowding*, and *solitude/privacy achieved* as dependent variables. The quality of experiences was found to be negatively related to number of other groups seen and statistically significant for 60% of respondents, while it was statistically significant and positive for 21% or respondents, and not statistically significant for 19%. The slope of the regression line for the 60% of negatively effected respondents was just -.41. The authors note this is quite small and "encounters would have to increase from 4 to 100 to reduce the quality of experience 50% [the authors used a scalar rating system for this variable], on average" (p. 115). The authors do note, however, that for five percent of respondents, the regression slope was less than -1.0. Encounters are a particularly detracting factor for this subgroup.

The relationship between perceived crowding and number of encounters was statistically significant for 80% of respondents. For these individuals the regression slope had a mean value of 1.0. The *solitude/privacy achieved* dependent variable fell somewhere between the other two. Seventy-seven percent of respondents had a statistically significant relationship between the two variables with a mean slope of -.69 for those who did.

The relationship between perceived crowding and *experience quality* was statistically significant for half of respondents, but had a slope of only -.28. *Experience*

quality had a stronger relationship with *solitude/privacy achieved*: 68% of respondents had a statistically significant, positive relationship, although the slope here was only .47.

From their results, Stewart and Cole conclude the quality of experience is quite high and crowding effects on this are quite minimal. They do note there are visitors who are profoundly effected by use levels and crowding, though. However, "[u]sing the admittedly arbitrary standard of a slope steeper than +/- 1.0 for relationships between independent variables and experience quality, only 2-6% of our sample were strongly effected by either encounters, perceived crowding, or privacy/solitude achieved" (p. 117).

Also of interest is the conclusion that crowding vulnerability was not statistically significantly different for visitors choosing low-use and high-use locations or between those who highly and lowly rated solitude-related recreation motivations.

Much in line with earlier criticisms of carrying capacity frameworks, Stewart and Cole describe the potential for situations where "the solution is worse than the problem" (p. 117). From their results they conclude "there is little empirical justification for limiting use" (p. 117). Further, they describe their results as consistent with most other empirical research on the topic.

Research Questions

The overall research goal is to investigate the nature and strength of the relationship between numerical use levels and perceived crowding relative to the hypothesized effects of other variables on visitors' crowding perceptions. While many studies have investigated the numerical relationship of use densities and perceived crowding, the relative importance of multiple other factors influencing crowding

perceptions has less frequently been investigated, although many have acknowledged the complexity of the perceived crowding concept in this regard.

One potentially important factor is recreational conflict. The concepts of perceived crowding and recreational conflict do not seem to be entirely separate based on Gramann's (1982) model of crowding described in the previous section of this literature review. It may be recalled that Gramann specifically delineates a concept of "behavioral crowding effects" (p. 112) consisting of negative reactions directly to the behavior of other recreationists. This would seem to represent a theoretical overlap with the commonly used definition from Jacob and Schreyer (1980) of "goal interference attributed to another's behavior" (p. 369). In addition to the theoretical link between these concepts, the differing encounter *norms* investigated between recreationists engaged in varying specific activities in studies such as Vaske and Donnelly (2002) suggest the potential interrelationship of perceived crowding and recreational use conflict.

The findings of Ditton et al. (1983), described in the *Crowding and Carrying Capacity* section of this literature review, noted the differing importance of particular motivations for the recreationists most negatively affected by perceived crowding. Most important among these were solitude-related motivations. These were measured via scale items derived from the REP scales. Similar scale items were used in crowding studies by Absher and Lee (1981) and Schreyer and Roggenbuck (1978). In three of the component studies used in this thesis research, similar solitude-related REP scale items are also available for investigation into the relationship between perceived crowding and these specific motivations. These scales are intended to assess the psychological, physical, and

social benefits individuals seek and the degree to which these are realized through recreational activities (Driver & Brown, 1986; Moore & Driver, 2005). The term *motivations* is used interchangeably with REP in describing these scales (Driver & Brown, 1986; Manfredo et al., 1996) and indeed, it is for this purpose of measuring recreational motivations that solitude-related REP scales items were used in this thesis research.

Another such group of factors hypothesized to be of importance in this regard is characteristics of respondents' groups, such as size, or whether they have used the services of an outfitter or guide. Stankey's (1973) findings of survey respondents' substantially negative reactions to encounters with large groups, surpassing negative reactions to more encounters with smaller groups, suggests the crowding perceptions of visitors may be colored by the size of their own groups as well. Hypothetically, being part of a larger group may select against the type of experience in which a respondent would report perceived crowding. Similarly, activities conducted under the guidance of an outfitter were hypothesized to be more structured and potentially less likely to be motivated by self-directed, solitude-type experiential goals. These variables were included despite the fact that I know of no previous crowding studies in which they are included.

Also, whether or not users have previously visited a site is thought to be important in determining their crowding perceptions. In a similar manner, the relationship between the length of time a recreationist has been visiting a site and their propensity for crowding at certain use levels is investigated. The importance of these variables was suggested by Nielsen, et al.'s (1977) concept of a recreational *last settler syndrome* wherein

recreationists desire site conditions to remain the same as in past visits. This type of variable has previously been used in studies of perceived crowding such as Ditton et al. (1983).

Such previous associations of users with recreation sites could lead to expectations about use levels prior to arriving at a site on a given day. When possible, variables measuring user expectations directly are used, thus investigating whether deviation from expected use levels, above or below, influences crowding responses. This was suggested by Schreyer and Roggenbuck's (1978) treatment of *expectancy and discrepancy* theory, as well as the relationship between use level expectations and perceived crowding noted by Womble and Studebaker (1981) and Shelby et al. (1983). Therefore use level expectations are used as an independent variable where available.

Manning (1999) includes resource impacts in his discussion of variables besides use density affecting crowding perceptions and visitor satisfaction. Following this example, visitor perceptions of resource impacts are also investigated as a potential factor influencing crowding perceptions.

Lastly, demographic factors are investigated to find whether a correlation exists with crowding-vulnerable/tolerant respondents. Demographic variables have been used in the previous perceived crowding study by Absher and Lee (1981), as well as the conceptual model presented by Manning (1999), though he notes no studies have identified a statistically significant relationship directly between any demographic factor and perceived crowding.

These relationships are analyzed through multivariate analyses in order to assess the relative strengths of these factors. Survey respondents' support for use limits are also

analyzed through multivariate analyses to assess the correlation between it and the aforementioned factors, as well as respondents' reported crowding perceptions. From this, carrying capacity-related management decisions can be better viewed from a stakeholder perspective and in an assessment of which factors lead to its perceived suitability.

The majority of this thesis research consists of these multivariate analyses of each applicable IORT study. In addition to these two research questions, the relationship between perceived crowding and visitor satisfaction, the propensity of visitors to disperse to other regional recreation sites when compelled by management restrictions, as well other means of looking for a potential relationship between recreational conflict and visitors support for use rationing are investigated to some degree using the available data. This serves to place the research at hand in its appropriate context within the outdoor recreation management field. The conceptual bases for these contextual questions are described below.

Contextual Question 1: What is the Relationship Between Respondents' Satisfaction Levels and Reported Crowding Perceptions?

Accepting that satisfaction in such studies has been criticized as an indicator and viewed as a simplification of complex social/behavioral processes (e.g., Manning, 1999), within the confines of this study, such data may help to contextualize and provide a background for a more substantive analyses. Essentially, user satisfaction is the ultimate goal of outdoor recreation managers and, as such, it is important to keep analysis in this context. Regardless of the limitations and weaknesses such an indicator may have, it

provides at least a rough estimation of success in this regard. Correlation/association between these two variables is therefore compared between available data sets.

Where available, open-ended questions asking dissatisfied respondents for the reasons for their negative experience are used to further assess the satisfaction-crowding relationship. This brief assessment of open-ended data may be suggestive of the degree to which perceived crowding contributes to visitor dissatisfaction.

Contextual Question 2: To What Extent Do Use Limits Have the Potential to Disperse Use to Similar Sites?

The second component of this initial investigation addresses potential dispersal of users due to hypothetical management actions limiting access to the study areas in question. Results consist of proportions of users reporting they would be likely participate in the same activity elsewhere if prevented from using the area studied in the given survey.

This relatively simple analysis is included to approach perceived crowding and carrying capacity at a regional perspective incorporating the interaction of various recreation sites within a larger geographic region and the potential for displacement of recreationists between individual sites (Blahna & Reiter, 2001; McCool & Cole, 2001). Such a regional perspective is desirable within the movement of natural resource management agencies towards an ecosystem management perspective. In an ecosystem management framework it is important for research to "take a broad perspective, recognizing the interconnectedness of ecosystem variables across large spatial and long temporal ranges" (Cortner & Moote, 1999, p. 42). Cortner and Moote also emphasize the

danger of managing biodiversity in isolated areas or parks without incorporating this important interconnectedness within ecosystems. There is no reason why this perspective would not be equally applicable to the specifically recreation management portion of the natural resources management field as a whole.

Moreover, the curvilinear relationship between recreational use and consequent soil and vegetation impacts highlights the necessity for managers to embrace broad regional perspectives. The ability of relatively few recreationists to cause the majority of site-level impacts while further use causes increasingly modest levels of additional impact (Thorn, Blahna, & Johnson, 1994; Cole, 1995[a]; Hammitt & Cole, 1998) indicates that management dispersal of use has the potential to increase biophysical impacts when viewed on a regional scale (Blahna & Reiter, 2001).

Contextual Question 3: Could Conflict be a Major Factor in Visitor Favorability Toward Use Limits?

It is hypothesized that the concept of *crowding* may not be entirely separate from that of *conflict* in respondents' answers to outdoor recreation surveys. This research question is meant to investigate, in exploratory rather than definitive terms, whether user responses interpreted by researchers as negative reactions to perceived crowding are sometimes more indicative of inter-user conflicts. While there may be a conceptual/theoretical difference in the mind of academics and outdoor recreation professionals, it is not clear this differentiation is effectively communicated to survey respondents through various assessments of crowding perception. As describe previously, Jacob and Schreyer (1980) described the concept of conflict as *goal*

interference between recreationists. Although there is some gray area between what constitutes *behavioral crowding* (Gramann, 1982) and *recreation conflict*, the concept of *conflict* is generally differentiated from that of *crowding*; the latter being based upon social preferences regarding privacy and a sense of solitude in outdoor recreation (Roggenbuck et al., 1991), while the former is a matter of the interference of one use with another or the incompatibility of different activity types or styles. In essence, the subject of investigation was whether respondents to outdoor recreation surveys were reporting excessive use levels when what they were negatively reacting to were specific uses, styles or types of use, or disruptive behaviors that interfere with their activity and specific recreational goals (e.g., the ability to find peace and quiet being disrupted by neighboring campers listening to a car radio, or the ability to fish being affected by the wake or proximity of personal watercraft).

One means of assessing potential overlap between these two concepts from the available data uses questions regarding respondents' support for potential or hypothetical use limits. Respondents supporting limits were then asked for open-ended responses regarding their reasoning for this. As use limits and closely related social carrying capacities are a management action aimed primarily at mitigating perceived crowding, responses identifying conflicts between users or types/styles of use could suggest user support for use limits is actually conflict-related to some degree. Because other types of management actions may be more effective in addressing recreation conflict (e.g., physical or temporal separation of activity types), this seemed to be a potentially useful line of investigation.

Figure 1 illustrates the hypothesized relationship of concepts investigated in this thesis research. Multivariate analysis was used to investigate the relationship between the factors in the boxes along the left of the model (boxes 1, 2, and 3) and both *perceived crowding* (box 4) and *use limits/carrying capacities* (box 5). Contextual Question 1 investigated the relationship between *perceived crowding* (box 4) and *overall satisfaction* (box 6). Contextual Question 2 dealt with the potential connection between *use limits/carrying capacities* (box 5) and *use dispersal* (box 7). Lastly, Contextual Question 3 delved into the relationship between *use limits/carrying capacities* (box 5) and both *use densities* (box 1) and *conflict* (box 2), as well as other factors. It should be noted that arrows do not necessarily represent any causal link between concepts.

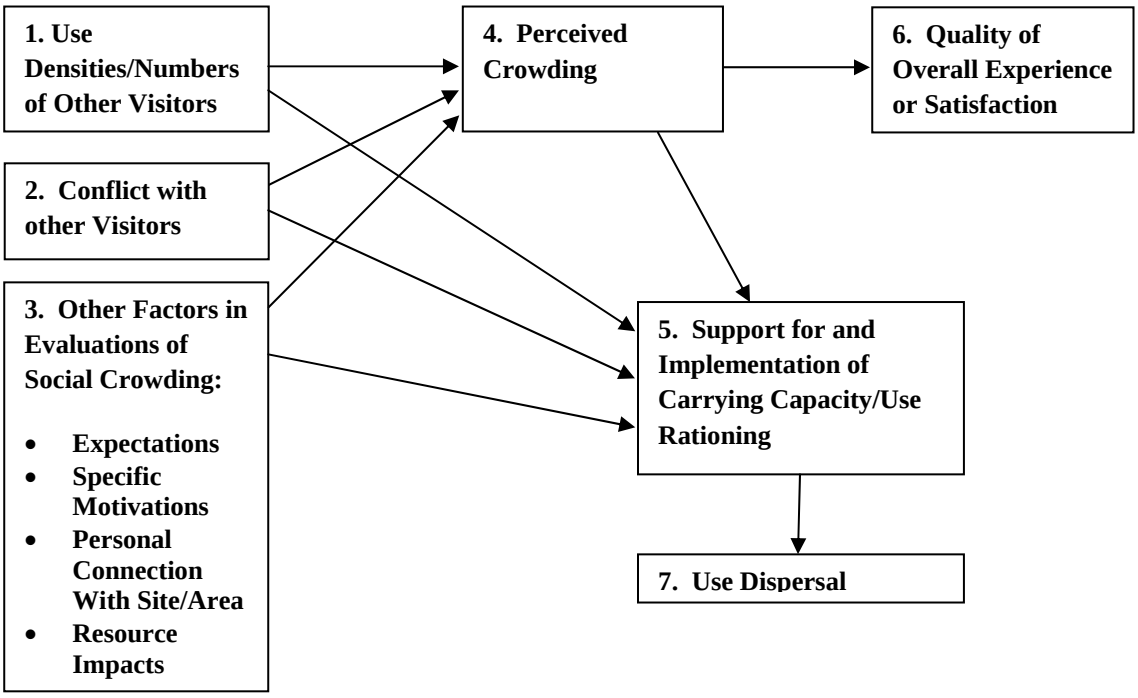

FIGURE 1 Relationship of variables based on implications from the literature.

CHAPTER 3

METHODS

Data used in this reanalysis were drawn from the following studies conducted by IORT between 1999 and 2006. To the extent possible, the component studies used similarly or identically worded questions, in similar formats, thereby facilitating the comparison of results. For the specifics of data collection and sampling within each survey, please refer to Appendix A. Survey instruments are reproduced in Appendix B.

Overview of Component Studies

The studies which comprise this thesis project represent several types of areas, supporting several dominant recreational activity types. The studies also use intercept, mail, and telephone surveys. Table 1 summarizes the studies' attributes, as well as the number of completed surveys and response rates for each.

1999 Utah State Park Boater Intercept Survey

This study was conducted for and funded by the Utah Division of Parks and Recreation at four Utah State Park reservoirs: Deer Creek, Jordanelle, Willard Bay, and East Canyon State Parks. The research objective was to obtain knowledge about visitor demographics, amounts and specific characteristics of water body use, visitor satisfaction, recreational conflicts, visitor opinions regarding use limits, information about potential use dispersal in the case of such limitations, and user comments and suggestions for park managers (Reiter et al., 2000).

TABLE 1 Component Study Attributes

Study	Type of survey	Geographic area	Area type	Dominant activities	N	Response rate
1999 UT State Park	intercept	N. Utah	lake/ reservoir	boating	1090	91.1%
2001 UT State Park	intercept	N. Utah	lake/ reservoir	boating	927	98.4%
2001 Mystic Lakes Boater	intercept[a]	W. South Dakota	lake/ reservoir	boating	303	80.8%
2001 Mystic Lakes Recreation	intercept	W. South Dakota	land	camping	226	96.9%
2001 South Fork Snake Boater	intercept	S.E. Idaho	river	fishing	1113	76.0%
2001 South Fork Snake Camper	intercept	S.E. Idaho	land	camping	101	80.2%
2001 UT River Int.	intercept	E. Utah	river	river running	2248	95.3%
2001 UT River Mail	mail	E. Utah	river	river running	802	57.5%
2004 GSENM Int.	intercept	S. Utah	land	hike/camp, etc.	573	95.8%
2004 GSENM Mail	mail	S. Utah	land	hike/camp, etc.	284	66.8%
2006 SASD	intercept	S.E. Idaho	land	motorized	592	92.6%
1999 UT State Park Tele.	telephone	Utah	lake/ reservoir	boating	350	62.4%
2006 UT State Park Tele.	telephone	Utah	lake/ reservoir	boating	397	60.6%

Note. See Appendix A for more detailed description or survey methods and sampling procedures.
[a]Slipholders were mailed survey forms.

1999 Utah State Park Boater Telephone Survey

This study was developed by IORT researchers in conjunction with Utah Division of Parks and Recreation (the funding agency for this project) personnel as part of an ongoing longitudinal study of registered Utah boat owners (Reiter et al., 2001[b]). In addition to comparing data with previous results, the telephone survey's objectives were

> …to obtain demographic information and ownership patterns and to obtain [boaters'] perception of: 1) boating trip frequency and fuel consumption; 2) preferred use of registration fees; 3) type of activities boaters engage in; 4) usefulness of boating education and safety programs; and 5) crowding and other issues that may affect the enjoyment of Utah's lakes and reservoirs. (Reiter et al., 2001[b], p. 2)

The data obtained from this study are used only for the contextual bivariate and univariate analyses component of this thesis research.

2001 Utah State Park Boater Intercept Survey

This study was similar to the 1999 *Utah State Park Boater Intercept Survey* (see above), but was conducted at Hyrum, Pineview, and Echo reservoirs and Bear Lake, all in Utah. Note that Pineview and Echo reservoirs are not state parks, though the Utah Division of Parks and Recreation is responsible for all recreational boating waters in the state (Reiter et al., 2002[a]; D. Reiter, personal communication, May 6, 2008).

2001 Mystic Lakes Recreational Visitors Survey (boater, recreation, slip-holder surveys)

This study was conducted for the Black Hills National Forest, USDA Forest Service, in western South Dakota in two water-based recreation areas, Sheridan Lake and Pactola Reservoir. Study objective were similar to those of the 1999 and 2001 *Utah State Park Boater Intercept Surveys* described above. However, separate surveys were given for boaters and recreationists at campsites. For boaters, intercept surveys with active boaters at boat ramps were conducted as well as mailing the survey to all slip-holders. As slip-holders' watercraft remain on the water bodies, and thus they do not make use of

boat ramps, this group would otherwise not have been captured by the survey (Reiter et al., 2002[b]).

2001 South Fork of the Snake River (boater survey and camper survey)

This study was prepared for the Bureau of Land Management (BLM), Idaho Falls Field Office, on a 39-mile stretch of the Snake River in southeastern Idaho. Both recreational boaters and campers were surveyed (Reiter et al., 2002[c]).

> The objectives of this study were to gain insights into [visitors'] demographic characteristics, recreational use patterns and characteristics, river trip satisfaction and conflicts, attitudes toward development along the river, and comments and recommendations regarding management rules and policy. (Reiter et al., 2002[c], p. 1)

This study contained very pertinent questions regarding visitors' perceptions of crowding in much the same manner as the previously listed intercept surveys despite their omission from the list of objectives quoted above.

2001 Utah River Study Intercept Survey

This study consisted of both an intercept and mail-back component (described below). This survey of recreationists on raftable "river segments on or adjacent to Bureau of Land Management (BLM) administered land in Utah" was conducted on the Colorado, Green, San Juan, and White Rivers (Reiter et al., 2001[a], p. II.i). The study was undertaken for and funded by the BLM. Specific waters were selected due to their support of both commercial/guided rafting and private users on stretches of whitewater. The intercept survey potion of the study "contained questions most dependent upon [respondents'] recall such as the number of boaters and watercraft they saw on their trip,

and crowding and conflict questions" (Reiter et al., 2001[a], p. II.5). The objective was to assess respondents' "demographic characteristics, river running use characteristics, satisfaction with river trip[s], identify conflict/problems, and trip expenditures" (Reiter et al., 2001[a], p. II.i).

2001 Utah River Study Mail Survey

The mail survey component of the *2001 Utah River Study* was considerably longer with the objective of assessing respondents' "1) river running experience, 2) river trip experience [i.e. the experiential aspects of their trip such as satisfaction and specific benefits], 3) river management preferences, 4) trip characteristics, and 5) background (demographic) information" (Reiter & Blahna, 2001, p. III.5).

2004 Front Country Visitor Study for Grand Staircase-Escalante National Monument (monument site intercept)

IORT conducted this study for the BLM-administered Grand Staircase-Escalante National Monument (GSENM) in southern Utah. The survey was conducted at the request of and funded by the GSENM, BLM. Data was collected at three types of front country sites: recreation sites (such as trailheads, campground and scenic attractions), overlooks, and visitor centers (Burr et al., 2006). For this thesis research, only those interviews conducted at monument recreation sites were deemed relevant to issues of outdoor recreation crowding perceptions, and overlook and visitor center intercept surveys were omitted.

> The surveys [intercept and mail surveys described below] were designed to collect data related to:
>
> 1. visitor characteristics and trip patterns;

2. visitor images and expectations, and perceptions of crowding and satisfaction related to the Monument as a whole and visitor centers, overlooks, and specific recreation sites on the Monument… (Burr et al., 2006, p. 1).

2004 Front Country Visitor Study for Grand Staircase-Escalante National Monument (mail-back survey)

The mail-back survey was administered to those respondents who agreed to participate during the intercept portion of the study in order to further investigate the research questions above in greater detail (Burr et al., 2006).

2006 Saint Anthony Sand Dunes Visitor Use Intercept Survey

This study was conducted at Saint Anthony Sand Dunes (SASD) in eastern Idaho at the request of BLM, Idaho Falls Field Office. The surveys were administered in 2004 and 2005. Two types of intercept surveys were used: an overnight survey and a day use/local resident survey. These surveys were designed to give the BLM information about "user preferences, use patterns, willingness to pay for use/facilities, visitor satisfaction, and perceived crowding/carrying capacity information" (Wagoner, Blahna, Burr, & Reiter, 2006, p. 2). In addition, key informant interviews in the surrounding community were conducted though that data was not incorporated into this thesis research (Wagoner et al., 2006).

2006 Utah State Park Boating Survey (telephone survey)

This survey formed a continuation of the longitudinal study described in the *1999 Utah State Park Boater Telephone Survey* described above. Telephone survey methods,

goals, and study region are similar to those previously defined. The 2006 study also included interviews and meetings with water body managers and employees, though this data is not used in this thesis research (Spain, Reiter, Blahna, & Burr, 2007).

Software Used

With only a few exceptions, all data analysis was performed using SPSS for Windows 15.0 statistical analysis software. For a few analyses, data were taken from two or three variables in an SPSS data file and combined in Microsoft Office Excel 2007 in order to simply identify proportions of open-ended responses falling into specific categories, as will be described below.

Contextual Bivariate and Univariate Analyses

Correlation Between Perceived Crowding and Satisfaction

Survey questions assessed both perceived crowding and satisfaction variables using ordinal scales. Perceived crowding was measured on a three-point scale in the 1999 and 2001 *Utah State Park Boater Intercept Surveys*, using response categories of "too many," "about right," and "too few." With the exception of the 1999 and 2006 *Utah State Park Boaters* telephone surveys, all other studies used five-point measures of crowding expanded from the earlier three-point scales. These included response categories of "far too many," "somewhat too many," "about right," "somewhat too few," and "far too few." The *2001 Utah River Study* included a perceived crowding question with respect to both people and watercraft encountered. Analyses were performed using

both variables. The *1999 Utah State Park Boaters Telephone Survey* did not query respondents about overall satisfaction while its 2006 successor did not query respondents about either variable. The *SASD* survey also did not ask a satisfaction question.

With one exception, the IORT surveys measured the satisfaction variable using a five-point scale, with a range of from response categories from "very satisfied," "satisfied," "neutral," "dissatisfied," to "very dissatisfied." The *GSENM* survey, however, measured this variable using a six-point scale containing possible responses of "very satisfied," "satisfied," "somewhat satisfied," and mirrored the *satisfied* side of the scale with corresponding *dissatisfied* response categories. The neutral response category used in other IORT studies was omitted here.

The research question investigating the relationship between satisfaction and perceived crowding was originally intended to use both variables in their ordinal forms and measure the association with a gamma statistical test and the statistical significance with chi-square analysis. Due to the notable (though not unexpected after reviewing the literature) paucity of dissatisfied respondents, it quickly became clear that the number of respondents in many crosstabulated categories were far too few to conduct this sort of analysis. Therefore, both variables were collapsed into dummy variables representing respondents as either crowded or not crowded, satisfied or dissatisfied. Neutral responses on the satisfaction scale were treated as missing data as they could not be fairly considered either satisfied or dissatisfied visitors. Chi-square analysis was then performed to measure statistical significance in the association between the variables. When deemed relevant, crosstabulations were also subdivided by study sites in order to

show differences in the perceived crowding-satisfaction relationship at different locations.

In addition to the quantitative analyses above, many of the surveys asked respondents for open-ended explanations of the reasons for their dissatisfaction. Data was available from all IORT surveys with the exceptions of the 1999 and 2006 *State Park Boater* telephone surveys, the *SASD* study, and the *2001 Utah River Study* (mail and intercept surveys). Respondents to the *Utah River Study* were asked about what they enjoyed most and least, and what added to and detracted from their experience, but this was not deemed sufficient to show causes of visitor dissatisfaction. For this analysis, respondents with "neutral" responses to satisfaction questions on surveys with neutral response categories were included, despite the fact that they were not intended to answer the question and were recorded via technician errors. The few answers erroneously recorded from satisfied respondents were omitted.

Except for the two *Utah State Park Boaters* intercept surveys, up to three responses per respondent had been coded. The *1999 State Park Boaters* intercept survey allowed for only one response, while the 2001 version of that survey allowed for two responses. Dissatisfied respondents to the *GSENM* study only gave one reason per respondent. Where multiple response variables were present for this survey question, responses from all response variables were combined and thus analyzed using individual responses, rather than respondents, as the unit of analysis.

With the exception of the *GSENM* survey, responses had been previously coded into varying numbers of categories. For each data set, responses and response categories were combined through an iterative process to arrive at the fewest number of categories

possible that accurately reflected open-ended responses in order to facilitate comparison between component studies and more directly address the research question.

Frequency of Possible Dispersal to Other Recreation Sites by Management Use Limits

In order to connect this study more directly with evaluation of the regional management perspectives advocated by Blahna and Reiter (2001) and McCool and Cole (2001), frequencies of respondents reporting they would either definitely or probably go elsewhere to pursue the same recreational activity were identified. This data was drawn from the 1999 and 2001 *Utah State Park Boater* intercept surveys, the *2001 Mystic Lakes* study, and the mail-back portion of the *2001 Utah River Study*. This analysis simply consisted of creating basic frequency tables to identify the relevant percentages of respondents.

Reasons for Respondents' Support of Use Limits

This line of inquiry was conducted to determine whether respondents supporting use limits were doing so because of crowding, or as a perceived means of eliminating conflict and problems with other users. Users who responded in the affirmative to questions regarding the potential implementation of use limits were then asked for open-ended responses explaining reasons for this support. Pertinent data was available from all IORT surveys used with the exception of the intercept portion of the *2001 Utah River Study*. The *GSENM* study specifically asked the question only of respondents who thought use should be "restricted to a *lower number of visitors than you saw today*"

(emphasis added) and is thus somewhat different from the other surveys that asked about the use of use limits more generally.

For all surveys, except the *SASD* and *GSENM* studies, responses were already coded in three response variables corresponding to up to three responses per respondent. In a similar manner to the open-ended responses regarding dissatisfaction described above, responses were iteratively combined with like response types into the fewest number of categories possible that accurately reflected respondents' answers while being more easily interpreted in relation to the research question. Responses from the previously uncoded *SASD* and *GSENM* studies were iteratively coded in the same manner.

Multivariate Analyses

Dependent Variables

Multivariate analyses conducted in this thesis research consisted of one or more multiple regression models for each IORT survey data set. Regression models were constructed for analysis of dependent variables representing perceived crowding and respondents' support for use limits. This led to two regression models for most data sets. Data from the 1999 and 2006 *State Park Boater* telephone surveys were not deemed appropriate for use in the multivariate analysis due to the lack of a perceived crowding question in the 2006 survey and a problematic question regarding perceived crowding in a generalized context regarding crowding on Utah reservoirs overall.

In the 1999 and 2001 *State Park Boater* intercept the 2001 *Mystic Lakes* surveys, *perceived crowding* was measured by a 3-point ordinal variable. This was used in its

collapsed form of crowded/not crowded as described in the explanation of the bivariate analyses of crowding and satisfaction above. Due to the use of a dichotomous dependent variable, logistic regression models were used for these analyses.

All other data sets used a 5-point variable for perceived crowding (described above) and this was used in this form, though coding was reversed to position the most crowded response category, "far too many," at the high end of the scale. Ordinary least squares (OLS) multiple regression models were then built around these dependent variables.

The *support for use limits* variable was similar across surveys with the exception of the *GSENM* study. The 4-point scale, ranging from "definitely" or "probably yes," to "definitely" or "probably no," was enlarged to a five point scale by including responses in the "don't know" category as a central point on the scale. Including this seemed valid as a category of ambivalence would logically fit between support and opposition with degrees of certainty subdividing these. The 5-point dependent variables for use limit support were then analyzed using OLS regression models.

The *GSENM* study used a dichotomous (yes/no) measure of *support for use limits*. This was analyzed using a logistic regression model.

Regression models for the 1999 and 2001 State Park Boater Intercept and Mystic Lakes Boater and Camper Surveys

As all four surveys used very similar survey instruments, all regression models were constructed in essentially the same manner. Demographic characteristics of respondents' sex (dummy variable) and age were included in the model, as were the size

of the respondents' recreational group, whether respondents had visited before (dummy variable), and the fullness of the parking lot measured in quartiles (i.e., response categories of "less than ¼ to ¼," "¼ to ½," "½ to ¾," and "¾ to full"). This was the only variable reflecting use level available from these survey instruments. The aforementioned variables were used in unaltered forms as they appeared on the survey instruments with the exception *of parking lot fullness* in the 2001 *Stat Park Boater* intercept survey, where due to the scarcity of cases in the "less than ¼ to ¼" category, the two lower categories were collapsed into a single category indicating the parking lot was half full or less.

Two variables requiring more intensive transformation were *number of years visiting the recreation site* and the *frequency of conflict with other visitors*. In order to create a variable representing the number of years respondents had visited the survey site, their response to the question asking for the year they had first visited (asked only of those whose responses indicated they were not first time visitors) was subtracted from the survey year. Respondents who indicated this was there first visit were coded as zeros as were those who had come for the first time within the last year. It was therefore theoretically useful to use both the *years visiting* variable and the variable indicating whether or not respondents were first-time visitors in order to reflect this distinction.

In the survey instruments, respondents were first asked whether they had experienced conflict with other visitors and then, if so, how often conflict had occurred, using a scale of "rarely," "sometimes," "often." These variables were combined for use in the regression models recoding negative responses (respondents who did not experience conflict) to the first question as "never" and combining this with responses

from the second question in order to construct a single variable using a four-point, ordinal scale. It should be noted that these survey questions were asked in general terms, across recreation visits, and thereby aimed at repeat visitors primarily, whereas the *perceived crowding* dependent variable refers to the current trip.

In addition to these transformed variables, a variable reflecting the size of each water body in surface acres was added due to the wide variation in sizes. This was transformed into a measurement in 100s of acres to make unstandardized regression coefficients (b values) more interpretable in regression analyses. Utah water body sizes were obtained from Utah Division of Parks and Recreation publications, while the size of Sheridan Lake and Pactola Reservoir had to be obtained from online tourism websites.

The *perceived crowding* dependent variables were analyzed using logistic regression models, as described above. The *support for use limits* dependent variables were analyzed using OLS regression and adding perceived crowding, in its ordinal rather than dichotomous form, as a further independent variable. Crosstabulation of variables in the *Mystic Lakes* camper and boater intercept surveys showed that the number of respondents (n = 226 and 303, respectively) and especially variation in variables such as *perceived crowding* was insufficient to conduct meaningful regression analyses. These two data sets were therefore excluded from multivariate analysis.

Regression Models for the 2001 South Fork of the Snake River Survey

The small size of the camper data set (n = 101), coupled with insufficient variation in important variables led to its omission from multivariate analysis. For the boater data set, regression models contained most of the independent variables from the

previously described data sets in the same or similar forms. Included were: the same demographic variables, sex and age; *years visiting* (derived in the same manner described above); *size of the respondents' group*, *parking lot fullness* (this time using the additional response category of *overflow*); and a measure of conflict, though in this case only a yes/no response (i.e., *conflict* was used as a dummy variable) was available. Although data recording whether or not respondents were first-time visitors was available, the variable was removed from the regression models due to moderate multicollinearity with the *number of years visiting* variable (r = -.507).

Additional variables from this data set used in constructing the regression models were: a dummy variable indicating whether or not respondents were using the services of an outfitter/guide; whether they were fishing from a boat (dummy variable); whether they were fishing from shore (dummy variable); the degree to which motorized watercraft were a problem for them; the degree to which inconsiderate boaters were a problem; the degree to which congestion at take-outs was a problem (the last three variables were measured on a four-point scale); and visitor estimates of the number of people encountered on the river. A variable representing congestion at put-ins was removed from the regression models due to serious multicollinearity with the *take out congestion* variable (r = .833).

OLS regression models were constructed for analysis of the five-point *perceived crowding* and *support for use limits* dependent variables. In the latter case, *perceived crowding* was again added as a further independent variable.

Regression Models for the 2001 Utah River Study Intercept Survey

This study consisted of both an intercept and mail-back component. The mail survey is discussed separately below. From this shorter intercept survey instrument, the independent variables used in the regression models were limited to: demographic factors of sex and age; whether or not this was a respondent's first time on the surveyed river segment (dummy variable); whether or not they were running the river privately or with a commercial outfitter/guide (another dummy variable); the size of the respondent's group; the respondent's estimated number of people encountered; and their estimated number of watercraft encountered. No transformations of these variables were necessary.

The survey instrument used two different *perceived crowding* measurements reflecting numbers of people encountered and numbers of watercraft encountered. The variables used five-point scales as described previously and both were used as dependent variables for their own regression models, as was a third, interactive variable created by combining these.

$$Crowd_{int} = Crowd_{watercraft} + Crowd_{people} + (Crowd_{watercraft} * DummyCrowd_{people})$$

This variable was constructed by adding the values of both variables and then adding the product of the perceived crowding relative to watercraft variable value multiplied and a dummy version of the perceived crowding relative to people variable reflecting whether or not they were crowded (0 = *far too few*, *somewhat too few*, and *about right*; 1 = *somewhat too many*, and *far too many*).

The intercept portion of the *Utah River Study* did not query respondents about their support for use limits so no further regression models were constructed for this study.

Regression Model for the 2001 Utah River Study Mail Survey

The mail survey instrument from this study differed substantially from the intercept surveys previously described. Many theoretically interesting questions were asked of respondents. Inasmuch as many of these were similar or related to one another, independent variables were parsed down by looking at the multicollinearity between them (as was done with all other regression models) and eliminating ones with less theoretical connection to the dependent variables. The independent variables used include several more demographic measures than the previously discussed surveys. In addition to age and sex, demographic independent variables included: *total household income*; *education level*; and the size of city, town, or rural area inhabited for most of the respondent's life. Variables similar to those used in the previously discussed regression models included *number of adults in group*, and the number of times respondents had floated the surveyed river segment. Several REP scale items related to the *solitude preference* construct/domain were included (using six-point measurement scales). In addition, respondents' feelings about specific problems were used to identify the prevalence of several conflict-related issues as well as problems with large groups, crowding at take-outs, and biophysical impacts of recreational use. These were measured using four-point scales. A dummy variable recording whether or not respondents engaged in fishing was included due to the hypothetical prevalence of crowding in

recreational angling inferred from the results of Blahna and Rieter's (2001) previous analysis of this data set and the prevalence of crowding perceptions on the fishing-centered South Fork of the Snake River previously analyzed in this thesis research.

Estimates of use level, with regard to both numbers of people and watercraft, were drawn from respondents' answers in the intercept portion of the study. In order to make use of these two independent variables, the two data sets were merged. This was possible because respondents' identification numbers corresponded between both data sets.

As the survey question regarding *support for use limits* was asked only of crowded respondents, the question was not capable of serving as an appropriate dependent variable.

Regression Models for the 2004 Grand Staircase-Escalante National Monument Intercept Survey

Although data from both the intercept and mail-back portions of the *GSENM* study were part of the same data set, separate regression models were conducted for each (see the mail-back survey regression model below). By doing so, the number of respondents included could be maximized in the intercept-only portion, while the pertinent questions from the mail-back portion could be used in the models including in separate regression analyses.

The intercept survey regression models were generally comparable to the regression models discussed previously. Included were: demographic factors of sex and age; number of individuals in the respondent's group; whether they had visited the site

before (dummy variable); the number of years they had been visiting the site (derived as discussed in the context of previous surveys); and whether expectations about the number of people to be encountered were exceeded, met, or fallen short of. This measure of visitors use level expectations was a theoretically important variable not available in the previously discussed surveys. The *parking lot fullness* variable, as in previous examples, was measured in quartiles with an additional category for overfull. This last category was collapsed into the *¾ to full* category due to its extreme infrequency. In addition, use level was measured by both *parking lot fullness* and respondents' *estimated number of encounters*.

For analysis of the 5-point *perceived crowding* dependent variable, an OLS regression model was constructed. For the dichotomous *support for use limits* dependent variable, a logistic regression was conducted. For the *support for use limits* logistic regression model, a dummy version of the *perceived crowding* independent variable (crowded/not crowded) was used due to cells with as few as two cases in crosstabulation of the ordinal version of this variable.

Regression Models for the 2004 Grand Staircase-Escalante National Monument Mail Survey

For the regression analyses including mail-back questionnaire responses, the same independent variables from the intercept-only analyses were included. In addition, two variables representing the *solitude preference* construct from the REP scales were included. These rated the importance of *seeing no people outside my group*, and *enjoying quiet and tranquility*. These two were selected after examining the multicollinearity

issues between the three possible solitude-related scale items through bivariate correlations. Both REP scale items were measured via 4-point scale.

Due to the reduced sample size when mail responses were included, many cells in crosstabulations of the *support for use limits* dependent variable and most ordinal independent variables were greatly insufficient. Therefore a logistic regression model was not constructed for this dependent variable.

Regression Model for the 2006 Saint Anthony Sand Dunes Intercept Survey

In the *SASD* intercept survey, questions regarding use level estimates, fulfillment of expectations about use level, and perceived crowding were asked about the open dunes area, the trails outside the open dunes area, and campgrounds. Because most respondents used the open dunes area, responses regarding this area were used so as to include the greatest possible number of respondents in the linear regression analysis.

For this data set, demographic questions of age and sex were again incorporated. From the many types of recreational conflict assessed by the survey instrument (with motorized users, horseback riders, hikers/backpackers/cavers, campers, hunters/anglers, and BLM managers), motorized conflict was selected as a surrogate for conflict generally due to its preeminence as a recreational activity at the SASD as well as its commonly observed role as a source of recreational conflict. The size of respondents' groups, their self reported skill level, and the number of years they had been visiting the SASD were also included as independent variables. The last of these was derived as in previously discussed studies, although in this case the overlap of the sampling period into January of 2005 complicated transforming the variable for all respondents, as the overwhelming

majority of surveys were given in 2004. The year of respondents' first visits, as recorded by the survey instrument, was subtracted from 2004. Resulting scores of -1 years were changed to zero for the few respondents who were repeat visitors, surveyed in January 2005, but had first come to the SASD within the month of January.

The three REP scale items measuring the *solitude* construct were all used as independent variables due to acceptably low levels of multicollinearity. On the survey, respondents were asked about whether or not they had an idea of the use level they would encounter before they arrived at the SASD using a four ordered response categories. Those with no idea were coded as one, while those with use level expectations were coded between two and four depending on the strength of their expectations. Responses in these three categories prompted respondents to rate the similarity of their expectations, again using four ranked response categories. Those selecting the two categories indicating use levels were different from expectations ("different" and "very different") were then asked whether there were more or fewer others visitors than expected. A single variable addressing whether use levels fell short of, met, or exceeded expectations was derived by combining responses to the latter two variables into a single variable. The two categories of "similar" responses ("similar" and "very similar") were combined into a single category, as were those for respondents indicating the use level was "different" from expectations. "Different" cases were then recoded as either one, for "fewer than expected," and three, for "more than expected," while responses indicating use levels were similar to expectations were coded as a two. Thus, a three point ordinal variable was available as an independent variable. Use level for these regression models

was measured by visitor estimates of the number of other people encountered. Respondents with no expectations of use level were treated as missing cases.

The 5-point *perceived crowding* dependent variable was analyzed with an OLS regression model. For the *support for use limits* dependent variable, the ambivalent *don't know* category was added between the *probably yes* and *probably no* categories as with previous data sets with survey questions asked in this manner.

Table 2 summarizes the availability of variables within each component study.

TABLE 2 Summary of Variables Available in Each Component Study

Study	Demographic Variables	Group Size	With commercial guide/outfitter	Visited before	Years /times visiting	Conflict	Water-body size	Est. use level	Parking lot Fullness	Fishing	REP: Solitude	Evaluation of potential problems	Use Level expectations	Perceived crowding[b]	Support for use limits[a]
1999 UT State Park Int.	X	X		X	X	X	X		X					X	X
2001 UT State Park Int.	X	X		X	X	X	X		X					X	X
2001 S. Fk. Snake Boater Int.	X	X	X		X	X		X	X			X		X	X
2001 UT River Study Int.	X	X		X				X						X	
2001 UT River Study Mail	X	X	X		X			X		X	X	X		X	
2004 GSENM Int.	X	X		X	X			X	X					X	X
2004 GSENM Mail	X	X		X	X			X	X		X		X	X	X
2006 SASD Int.	X	X		X	X	X		X			X		X	X	X

"X" indicates variables present in each survey.

[a]Support for use limits is a dependent variable only.

[b]Perceived crowding serves as both a dependent variable and an independent variable in the models using support for use limits as the dependent variable.

CHAPTER 4

RESULTS

In this chapter, specific analysis results are described in two sections. First, the results of the three bivariate/univariate contextualizing questions are reported, followed by presentation of the results to the multivariate analyses central to this project. Chapter 5: Synthesis and Discussion will then present side-by-side comparison of these results in order to reach broader conclusions from the individual analyses and highlight the similarities and differences between them.

Bivariate and Univariate Analyses

Three research areas were pursued for the purpose of contextualizing overall results of this research. The individual results of each of these research questions are presented below, divided by component study or groups of similar component studies.

Correlation between Perceived Crowding and Satisfaction

For each component study data set, results are displayed for either two or three of the following analyses: 1) Crosstabulations of *satisfaction* and *perceived crowding* variables and Pearson chi-square values are reported (information on interpretation of chi-square analysis was obtained from Knoke, Bohrnstedt, and Mee, 2002); 2) this is followed, when relevant, by a breakdown of these crosstabultions by individual survey sites; 3) finally, respondents' stated reasons for their dissatisfaction are reported. In

studies where respondents were allotted more than one response, these reasons are reported using *response*, as opposed to *respondent*, as the unit of analysis.

1999 State Park Intercept Survey

The Pearson chi-square statistical test yielded a non-statistically significant relationship between perceived crowding and satisfaction variables at the 0.05 level for this study (Table 3). Only 47 of 928 respondents (5.1%) were dissatisfied while only 146 (15.7%) experienced perceived crowding. Results by water body were roughly comparable, though levels of crowding and dissatisfaction are both somewhat lower at Willard Bay than at other sites (Table 4).

In open-ended survey responses, four out of 57 dissatisfied or neutral respondents (7.0%) attributed their dissatisfying recreational experience specifically to crowding (Table 5). This ranked behind bad weather, inter-user conflict, lack of angling success, and mechanical problems with motorboats and PWCs. Unlike most of the component studies that follow, the unit of analysis used in the *1999 State Park intercept survey* is the individual *respondent*, rather than the *response* (see Chapter 3: Methods).

TABLE 3 *1999 State Park Intercept*: Crosstabulation of *Satisfaction* and *Perceived Crowding*

		Satisfaction		
		satisfied	dissatisfied	Total
Perceived Crowding				
not crowded				
	n	746	36	782
	% within crowding	95.4%	4.6%	
crowded				
	n	135	11	146
	% within crowding	92.5%	7.5%	
Total		881	47	928
	value	df	p	
Pearson Chi-Square	2.198	1	.138	

n = 928, missing cases = 162

TABLE 4 *1999 State Park Intercept*: Crosstabulation of *Satisfaction* and *Perceived Crowding* by Water Body

Water Body	Perceived Crowding	Satisfaction		Total
		satisfied	dissatisfied	
Deer Creek				
	not crowded			
	n	181	12	193
	% within crowding	93.8%	6.2%	
	crowded			
	n	43	4	47
	% within crowding	91.5%	8.5%	
	Total	224	16	240
Jordanelle				
	not crowded			
	n	191	11	202
	% within crowding	94.6%	5.4%	
	crowded			
	n	38	1	39
	% within crowding	97.4%	2.6%	
	Total	229	12	241
Willard Bay				
	not crowded			
	n	222	5	227
	% within crowding	97.8%	2.2%	
	crowded			
	n	11	1	12
	% within crowding	91.7%	8.3%	
	Total	233	6	239
East Canyon				
	not crowded			
	n	152	8	160
	% within crowding	95.0%	5.0%	
	crowded			
	n	43	5	48
	% within crowding	89.6%	10.4%	
	Total	195	13	208

n = 928, missing cases = 162

2001 State Park Intercept Survey

In this study, 66 of 893 respondents (7.4%) were dissatisfied, while 106 of 893 respondents (11.9%) reported crowding. This is a slightly higher dissatisfaction rate but a slightly lower perceived crowding rate than was found for the reservoirs comprising the *1999 State Park intercept* survey. A Pearson chi-square test yielded a statistically

TABLE 5 *1999 State Park Intercept*: Reasons Respondents Were *Dissatisfied* or *Neutral*[a]

Reason for Dissatisfaction	n	%
Weather	18	31.6%
Conflict	12	21.1%
Did not catch any fish	8	14.0%
Conflict with management/camp host	7	12.3%
Mechanical problems with watercraft	5	8.8%
Crowding	4	7.0%
Beach condition/substrate	3	5.3%
Total	57	

[a]48 *dissatisfied* respondents and 9 *neutral* respondents (unit of analysis is respondent).

significant relationship between perceived crowding and satisfaction variables at the .005 level, unlike the previous study (Table 6). Higher perceived crowding ratings were associated with lower satisfaction. As with the previous state park study, the reservoirs appear to be roughly comparable, though again the largest water body, Bear Lake, showed somewhat lower rates of both perceived crowding and dissatisfaction (Table 7). Reasons for respondents' dissatisfaction are shown using *responses* as opposed to *respondents* as the unit of analysis. This is necessary because respondents were allowed to give up to two responses. Five responses out of 85 (5.9%) attributed dissatisfaction to

TABLE 6 *2001 State Park Intercept*: Crosstabulation of *Satisfaction* and *Perceived Crowding*

		Satisfaction		
		satisfied	dissatisfied	Total
Perceived Crowding				
not crowded				
	n	736	51	787
	% within crowding	93.5%	6.5%	
crowded				
	n	91	15	106
	% within crowding	85.8%	14.2%	
Total		827	66	893

	value	df	p
Pearson Chi-Square	8.031	1	.005

n = 893, missing cases = 19

TABLE 7 *2001 State Park Intercept*: Crosstabulation of *Satisfaction* and *Perceived Crowding* by Water Body

Water Body	Perceived Crowding	Satisfaction: satisfied	Satisfaction: dissatisfied	Total
Hyrum				
	not crowded			
	n	164	10	174
	% within crowding	94.3%	5.7%	
	crowded			
	n	20	5	25
	% within crowding	80.0%	20.0%	
	Total	184	15	199
Echo				
	not crowded			
	n	139	17	156
	% within crowding	89.1%	10.9%	
	crowded			
	n	22	5	27
	% within crowding	81.5%	18.5%	
	Total	161	22	183
Pineview				
	not crowded			
	n	259	12	271
	% within crowding	95.6%	4.4%	
	crowded			
	n	39	4	43
	% within crowding	90.7%	9.3%	
	Total	298	16	314
Bear Lake				
	not crowded			
	n	174	12	186
	% within crowding	93.5%	6.5%	
	crowded			
	n	10	1	11
	% within crowding	90.9%	9.1%	
	Total	184	13	197

n = 893, missing cases = 19

crowding. In a similar manner to the 1999 study, this ranked behind (in order of importance) lack of angling success, bad weather, inter-user conflict, and mechanical problems with the respondent's watercraft (Table 8).

TABLE 8 *2001 State Park Intercept*: Reasons Respondents Were *Dissatisfied*

Reason for Dissatisfaction	n	%
Did not catch any fish	18	21.2%
Weather	16	18.8%
Conflict	11	12.9%
Mechanical problems with watercraft	10	11.8%
Crowding	5	5.9%
Ramp/Dock inadequate for use level	4	4.7%
Other	21	24.7%
Total	85	

Note. Unit of analysis is valid responses rather than respondents (85 responses from 65 respondents).

2001 Mystic Lakes Boater Intercept Survey (includes slipholder mail survey results)

In conducting Pearson chi-square analysis, one cell had an insufficient expected value for a valid analysis, though the results were statistically significant below the 0.001 level. The extremely small number of dissatisfied respondents, six out of 285 (2.1%), makes interpretation of this problematic. Thirty out of 285 respondents (10.5%) reported crowding (Table 9). Perceived crowding, however, does seem to be more of a problem at

TABLE 9 *2001 Mystic Lakes Boater Intercept*: Crosstabulation of *Satisfaction* and *Perceived Crowding*

		Satisfaction		
		satisfied	dissatisfied	Total
Perceived Crowding				
not crowded				
	n	253	2	255
	% within crowding	99.2%	.8%	
crowded				
	n	26	4	30
	% within crowding	86.7%	13.3%	
Total		279	6	285

	value	df	p
Pearson Chi-Square[a]	20.510	1	.000

n = 285, missing cases = 18.

[a]The expected value for the cell corresponding to *dissatisfied*/*crowded* was insufficient for a valid chi-square analysis.

Pactola Lake, likely due to its greater ease of access and higher use levels (Doug Reiter, personal correspondence, May 21, 2008) (Table 10).

Two respondents attributed their dissatisfaction directly to overcrowding. Both had also reported crowding in their responses to the forced-choice perceived crowding question. This ranked second, behind inter-user conflict, as a stated reason for dissatisfaction and tied with restroom-related complaints (Table 11).

TABLE 10 *2001 Mystic Lakes Boater Intercept*: Crosstabulation of *Satisfaction* and *Perceived Crowding* by Water Body

		Satisfaction		
Water Body	Perceived Crowding	satisfied	dissatisfied	Total
Sheridan				
	not crowded			
	n	69	1	70
	% within crowding	98.6%	1.4%	
	crowded			
	n	3	0	3
	% within crowding	100.0%	.0%	
	Total	72	1	73
Pactola				
	not crowded			
	n	184	1	185
	% within crowding	99.5%	.5%	
	crowded			
	n	23	4	27
	% within crowding	85.2%	14.8%	
	Total	207	5	212

n = 285, missing cases = 18

TABLE 11 *2001 Mystic Lakes Boater intercept*: Reasons Respondents Were *Dissatisfied*

Reason for Dissatisfaction	n	%
Conflict	4	44.4%
Crowding	2	22.2%
Restrooms dirty/too few	2	22.2%
Weather	1	11.1%
Total	9	

Note. Unit of analysis is valid responses rather than respondents (9 responses from 5 respondents).

2001 Mystic Lakes Recreation Intercept Survey (non-boaters)

Again, insufficient expected values were found in two cells undermining the suitability of chi-square analysis, which was, in this case, not statistically significant. Five out of 215 respondents (2.3%) were dissatisfied while 9 (4.2%) reported perceived crowding (Table 12). Both perceived crowding and dissatisfaction were quite rare for surveyed campsites at both lakes (Table 13). No respondent attributed dissatisfaction to crowding in open-ended responses (see Table 14).

2001 South Fork of the Snake River Boater Intercept Survey

Pearson chi-square analysis yielded a non-statistically significant relationship between satisfaction and perceived crowding for this study. Dissatisfaction was low in this study (26 of 963 respondents or 2.7%) despite the fact that a relatively large portion

TABLE 12 *2001 Mystic Lakes Recreation Intercept*: Crosstabulation of *Satisfaction* and *Perceived Crowding*

		Satisfaction		
		satisfied	dissatisfied	Total
Perceived Crowding				
not crowded				
	n	201	5	206
	% within crowding	97.6%	2.4%	
crowded				
	n	9	0	9
	% within crowding	100.0%	.0%	
Total		210	5	215

	value	df	p
Pearson Chi-Square[a]	.224	1	.636

n = 215, missing cases = 11

[a]The expected value for the cells corresponding to *dissatisfied*/*not crowded* and *dissatisfied*/*crowded* were insufficient for a valid chi-square analysis.

TABLE 13 *2001 Mystic Lakes Recreation Intercept*: Crosstabulation of *Satisfaction* and *Perceived Crowding* by Water Body

Water Body	Perceived Crowding	Satisfaction: satisfied	Satisfaction: dissatisfied	Total
Sheridan				
	not crowded			
	n	102	2	104
	% within crowding	98.1%	1.9%	
	crowded			
	n	3	0	3
	% within crowding	100.0%	.0%	
	Total	105	2	107
Pactola				
	not crowded			
	n	99	3	102
	% within crowding	97.1%	2.9%	
	crowded			
	n	6	0	6
	% within crowding	100.0%	.0%	
	Total	105	3	108

n = 215, missing cases = 11

TABLE 14 *2001 Mystic Lakes Recreation Intercept*: Reasons Respondents Were D*issatisfied*

Reason for Dissatisfaction	n	%
Problems with camp host	1	20%
Dirty campsites	1	20%
Weather	1	20%
Restrooms dirty	1	20%
Handicapped restroom closed	1	20%
Total	5	

Note. Unit of analysis is valid responses rather than respondents (5 responses from 3 respondents).

of respondents (355 of 963 respondents or 36.7%) reported some degree of perceived crowding (Table 15).

In open-ended responses, six dissatisfied and neutral respondents attributed their dissatisfaction to crowding-related issues—five related to numbers of boats and one to noisiness (Table 16). This ranked behind a lack of angling success and inter-user conflict

TABLE 15 *2001 S.Fk. Snake River Boater Intercept*: Crosstabulation of *Satisfaction* and *Perceived Crowding*

		Satisfaction		
		satisfied	dissatisfied	Total
Perceived Crowding				
not crowded				
	n	593	15	608
	% within crowding	97.5%	2.5%	
crowded				
	n	344	11	355
	% within crowding	96.9%	3.1%	
Total		937	26	963
	value	df	p	
Pearson Chi-Square	.340	1	.560	

n = 963, missing cases = 150

as a reason for dissatisfaction. Only dissatisfied respondents were asked for reasons for their dissatisfaction but some responses were erroneously recorded from satisfied and neutral respondents nonetheless. Responses from neutral respondents were included while those from satisfied responses were discarded.

TABLE 16 *2001 S.Fk. Snake River Boater Intercept*: Reasons Respondents Were *Dissatisfied* or *Neutral*[a]

Reason for Dissatisfaction	n	%
Did not catch fish	11	32.4%
Conflict	8	23.5%
Crowding	6	17.6%
Water fluctuations impact on fishing	5	14.7%
Biophysical impacts	3	8.8%
Misc.	1	2.9%
Total	34	

Note. Unit of analysis is valid responses rather than respondents (34 responses from 25 respondents).

[a]30 responses from *dissatisfied* respondents and 4 from *neutral* respondents.

2001 South Fork of the Snake River Camper Intercept Survey

The presence of very few dissatisfied and crowded respondents again caused insufficient expected cell values in chi-square analysis whose results were not statistically significant. Of the two dissatisfied respondents (2.5%), neither reported perceived crowding. Ten of 79 respondents (12.7%) reported crowding (Table 17). Crowding did not come up in the open-ended explanations of dissatisfaction by respondents (Table 18).

TABLE 17 *2001 S.Fk. Snake River Camper Intercept*: Crosstabulation of *Satisfaction* and *Perceived Crowding*

		Satisfaction		
		satisfied	dissatisfied	Total
Perceived Crowding				
not crowded				
	n	67	2	69
	% within crowding	97.1%	2.9%	
crowded				
	n	10	0	10
	% within crowding	100.0%	.0%	
Total		77	2	79

	value	df	p
Pearson Chi-Square[a]	.297	1	.586

n = 79, missing cases = 22

[a]The expected value for the cells corresponding to *dissatisfied*/*not crowded* and *dissatisfied*/*crowded* were insufficient for a valid chi-square analysis.

TABLE 18 *2001 S.Fk. Snake River Camper Intercept*: Reasons Respondents Were *Dissatisfied*

Reason for Dissatisfaction	n	%
Bathroom condition/human waste	1	33.3%
Lack of benches and tables	1	33.3%
Fireplace condition	1	33.3%
Total	3	

Note. Unit of analysis is valid responses rather than respondents (3 responses from 2 respondents).

Insufficient expected cell values were once again a problem with crosstabulations of satisfaction and crowding with regard to both numbers of watercraft (Table 19) and people (Table 20). Neither of these chi-squares was statistically significant. To compare the two types of perceived crowding, a chi-square analysis of both measures was

TABLE 19 *2001 Utah River Study Intercept*: Crosstabulation of *Satisfaction* and *Perceived Crowding* for Number of Watercraft

		Satisfaction		
		satisfied	dissatisfied	Total
Perceived Crowding				
not crowded				
	n	1807	13	1820
	% within crowding	99.3%	.7%	
crowded				
	n	344	1	345
	% within crowding	99.7%	.3%	
Total		2151	14	2165
	value	df	p	
Pearson Chi-Square[a]	.813	1	.367	

n = 2165, missing cases = 83

[a]The expected value for the cell corresponding to *dissatisfied*/*crowded* was insufficient for a valid chi-square analysis.

TABLE 20 *2001 Utah River Study Intercept*: Crosstabulation of *Satisfaction* and *Perceived Crowding* for Number of People

		Satisfaction		
		satisfied	dissatisfied	Total
Perceived Crowding				
not crowded				
	n	1716	12	1728
	% within crowding	99.3%	.7%	
crowded				
	n	442	2	444
	% within crowding	99.5%	.5%	
Total		2158	14	2172
	value	df	p	
Pearson Chi-Square[a]	.328	1	.567	

n = 2172, missing cases = 76

[a]The expected value for the cell corresponding to *dissatisfied*/*crowded* was insufficient for a valid chi-square analysis.

conducted (relative to numbers of people and watercraft). This yielded a statistically significant relationship ($\chi^2 = 1293.38$, $p < .001$) showing respondents reporting crowding relative to one type of encounter tended to report it relative to the other. Again we see low levels of both types of crowding and extremely low levels of dissatisfaction. Fourteen of 2,172 respondents (.6%) were dissatisfied, while 444 (20.4%) reported perceived crowding relative to number of people encountered (Table 20). The breakdown of these data by river segment, where low-use and fishing-oriented segments had much higher perceived crowding levels, is detailed in Blahna and Reiter (2001).

This study did not directly assess reasons for dissatisfaction. Therefore, no open-ended responses were coded for identification of perceived crowding issues.

2001 Utah River Study Mail Survey

Results from analysis of the mail survey were similar to those for the intercept (Table 21). The perceived crowding question related to the number of people

TABLE 21 *2001 Utah River Study Mail Survey*:
Crosstabulation of *Satisfaction* and *Perceived Crowding*

		Satisfaction		
		satisfied	dissatisfied	Total
Perceived Crowding				
not crowded				
	n	614	15	629
	% within crowding	97.6%	2.4%	
crowded				
	n	116	2	118
	% within crowding	98.3%	1.7%	
Total		730	17	747
	value	df	p	
Pearson Chi-Square[a]	.213	1	.645	

n = 747, missing cases = 70

[a]The expected value for the cell corresponding to *dissatisfied*/*crowded* was insufficient for a valid chi-square analysis.

encountered. Seventeen of 747 respondents (2.3%) reported dissatisfaction, while 118 (15.8%) reported perceived crowding.

Grand Staircase-Escalante National Monument Visitor Intercept Survey

Insufficient expected values again interfered with analysis due to the extremely low rate of dissatisfaction (three out of 567 or .5%). Eighty-five of 567 respondents (15.0%) reported perceived crowding (Table 22). Surprisingly, no respondent reported both dissatisfaction and perceived crowding, even at relatively highly used areas such as the Calf Creek trailhead (Table 23).

Of the three dissatisfied respondents, none mentioned crowding in open ended responses. Reasons for dissatisfaction were related to the inability to access desired areas because of vehicle limitations or use limits/permit systems (Table 24).

TABLE 22 *2004 GSENM Intercept*: Crosstabulation of *Satisfaction* and *Perceived Crowding*

		Satisfaction		
		satisfied	dissatisfied	Total
Perceived Crowding				
not crowded				
	n	479	3	482
	% within crowding	99.4%	.6%	
crowded				
	n	85	0	85
	% within crowding	100.0%	.0%	
Total		564	3	567
	value	df	p	
Pearson Chi-Square[a]	.532	1	.466	

n = 567, missing cases = 6

[a]The expected values for the cells corresponding to *dissatisfied*/*crowded* and *dissatisfied*/*not crowded* were insufficient for a valid chi-square analysis.

TABLE 23 *2004 GSENM Intercept*: Crosstabulation of *Satisfaction* and *Perceived Crowding* by Selected High-Profile Monument Site

		Satisfaction		
Site	Perceived Crowding	satisfied	dissatisfied	Total
Paria Movie Set				
	not crowded			
	N	66	1	67
	% within crowding	98.5%	1.5%	
	crowded			
	N	4	0	4
	% within crowding	100.0%	.0%	
	Total	70	1	71
Grosvenor Arch				
	not crowded			
	N	70		70
	% within crowding	100.0%		
	crowded			
	N	5		5
	% within crowding	100.0%		
	Total	75		75
Devil's Garden				
	not crowded			
	N	38	1	39
	% within crowding	97.4%	2.6%	
	crowded			
	N	13	0	13
	% within crowding	100.0%	.0%	
	Total	51	1	52
Escalante River trailhead				
	not crowded			
	N	45		45
	% within crowding	100.0%		
	crowded			
	N	8		8
	% within crowding	100.0%		
	Total	53		53
Calf Creek trailhead				
	not crowded			
	N	66		66
	% within crowding	100.0%		
	crowded			
	N	25		25
	% within crowding	100.0%		
	Total	91		91

(continued)

TABLE 23 *2004 GSENM Intercept*: Crosstabulation of *Satisfaction* and *Perceived Crowding* by Selected High-Profile Monument Sites (continued)

Burr Trail				
	not crowded			
		N	24	24
		% within crowding	100.0%	
	crowded			
		N	4	4
		% within crowding	100.0%	
	Total		28	28
Calf Creek campground				
	not crowded			
		N	14	14
		% within crowding	100.0%	
	crowded			
		N	5	5
		% within crowding	100.0%	
	Total		19	19
All other sites				
	not crowded			
		N	156	1 157
		% within crowding	99.4%	.6%
	crowded			
		N	21	0 21
		% within crowding	100.0%	.0%
	Total		177	1 178

n = 567, missing cases = 6

TABLE 24 *2004 GSENM Intercept*: Reasons Respondents Were *Dissatisfied*

Reason for Dissatisfaction	n	%
Unable to see/access desired area	2	66.7%
Lack of non-four wheel drive access	1	33.3%
Total	3	

Note. Unit of analysis is respondent.

Frequency of Potential Use Dispersal Due to Use Limits

For each applicable component survey, the following section reports results to survey questions asking what respondents would do if prevented from accessing the survey site/area due to use limits. Response categories allowed respondents to indicate if

they would pursue the same activity elsewhere, pursue other activities ("something else"), or were uncertain as to what they would do.

1999 State Park Intercept Survey

Responses indicated 64.2% of surveyed visitors would probably or definitely pursue the same activity elsewhere, while 21.1% would do something else. This survey also included a "no" response category which was dropped from subsequent survey instruments as its meaning is unclear (Table 25).

2001 State Park Intercept Survey

Results from the 2001 survey were similar with 63.4% of respondents indicating they would probably or definitely go elsewhere for recreational boating (Table 26). A

TABLE 25 *1999 State Park Intercept*: What Respondents Would Do if Denied Access to Survey Site Due to Use Limits

Response	n	%
boating elsewhere (definitely)	368	33.8%
boating elsewhere (probably)	331	30.4%
something else	230	21.1%
unsure	28	2.6%
no	35	3.2%
missing	98	9.0%
Total	1090	

TABLE 26 *2001 State Park Intercept*: What Respondents Would Do if Denied Access to Survey Site Due to Use Limits

Response	n	%
boating elsewhere (definitely)	386	42.3%
boating elsewhere (probably)	192	21.1%
something else	306	33.6%
unsure	23	2.5%
missing	5	.5%
Total	912	

somewhat larger percentage, 33.6% indicated they would do something else, possibly as a result the elimination of the "no" category and the presence of far fewer missing cases.

2001 Mystic Lakes Boater Intercept Survey
(includes slipholder mail survey results)

Far fewer Mystic Lakes boaters indicated they would probably or definitely go elsewhere (20.1%) than was true of respondents at Utah state parks, though the number who would do something else was rather low and comparable to the results from the two previously described surveys (22.1%) (Table 27). As 36.0% of respondents were slipholders whose watercraft are stored on the water at the Mystic Lakes and are therefore unable to easily move their watercraft elsewhere, the results are difficult to compare with the Utah state park surveys. Also, unlike Utah state parks, the Mystic Lakes provide an opportunity not otherwise available within a reasonable driving distance and visitors are probably not as easily dispersed for this reason (Doug Reiter, personal communication, May 6, 2008).

TABLE 27 *2001 Mystic Lakes Boater Intercept*: What Respondents Would Do if Denied Access to Survey Site Due to Use Limits

Response	n	%
boating elsewhere (definitely)	30	9.9%
boating elsewhere (probably)	31	10.2%
something else	67	22.1%
Unsure	20	6.6%
Slipholder	109	36.0%
Missing	46	15.2%
Total	303	

2001 Mystic Lakes Recreation Intercept Survey (non-boaters)

Results from Mystic Lakes campgrounds indicated 55.7% of respondents would probably or definitely go elsewhere for a similar type of recreational activity. Fewer campground recreationists than boaters at the Mystic Lakes would do something else (15.0%) (Table 28). The presence of a substantial number of slipholders in the boater data set makes comparison with the non-boater data-set problematic.

2001 Utah River Study Mail Survey

Mail respondents to the *Utah River Study* would probably or definitely pursue similar river recreation activities elsewhere in 51.4% of cases, while 31.5% of respondents would so something else (Table 29).

Do Respondents Support Use Limits Because of Crowding or Because of Conflict and/or Other Factors?

In addressing this research question, it was deemed necessary to first report the overall respondent support for use limits. Following this, respondent's reasons for

TABLE 28 *2001 Mystic Lakes Recreation Intercept*: What Respondents Would Do if Denied Access to Survey Site Due to Use Limits

Response	n	%
beach/camping elsewhere (definitely)	78	34.5%
beach/camping elsewhere (probably)	48	21.2%
something else	34	15.0%
unsure	26	11.5%
missing	40	17.7%
Total	226	

TABLE 29 *2001 Utah River Study Mail Survey*: What Respondents Would Do if Denied Access to Survey Site Due to Use Limits

Response	n	%
beach/camping elsewhere (definitely)	198	24.2%
beach/camping elsewhere (probably)	222	27.2%
something else	257	31.5%
unsure	94	11.5%
missing	46	5.6%
Total	817	

supporting use limits are reported. Thus, the proportion of responses supporting use limits can be taken into account when observing the most common categories of stated reasons for this support. These results are separated, when pertinent, by survey location in order to address differences between individual sites within some of the component studies. With the exception of the *2004 GSENM* study, all analyses of the reasons respondents support use limits use *response* rather than *respondent* as the unit of analysis because respondents were allowed more than one response to this question.

While most of the categories of grouped responses described below are relatively self explanatory, some may require a brief description. The category referred to as *experience quality* consisted of responses indicating that use levels should be limited in order to maintain a "fun" experience, make the area more enjoyable, or similar types of responses that did not specify crowding-type, conflict-related, or other factors that could be clearly identified. It seemed an unfair assumption to assign these directly to perceived crowding concerns, though many of them may be, because of the prevalence of safety- and conflict-related (and other) concerns amongst responses overall. These less well articulated responses are perhaps best interpreted as indeterminate. The *ability of*

facilities to accommodate use level group of responses contains responses referring to use levels exceeding the physical capacities of management constructed infrastructure such as boat ramps, developed campgrounds, parking lots, and marinas, for example. The miscellaneous (*misc.*) group consisted of infrequent responses that were not otherwise classifiable, along with erroneous responses indicating support for management actions other than use limits, such as spatial zoning.

1999 State Park Intercept Survey

Overall, 65.8% of respondents probably or definitely supported use limits, while 29.3% probably or definitely did not (Table 30). Perceived crowding ranked as the principal reason for this support (40.4%), followed closely by safety concerns (36.0%). Conflict ranked fourth at just 6.7% of responses (Table 31).

2001 State Park Intercept Survey

Overall, 59.6% of respondents to the *2001 State Park Intercept Survey* reported that they probably or definitely supported use limits, with 38.7% feeling the opposite way (Table 32). Crowding again ranked first among reasons for this support (43.6%) with

TABLE 30 *1999 State Park Intercept*: Respondents' Feelings About the Need for Use Limits

	Lake/Reservoir				
Need to limit number of boats?	Deer Creek	Jordanelle	Willard Bay	East Canyon	Overall
Definitely yes	41.1%	44.6%	25.9%	42.4%	38.4%
Probably yes	32.0%	25.0%	21.6%	31.7%	27.4%
Probably no	14.2%	12.7%	29.8%	14.3%	17.8%
Definitely no	9.9%	10.4%	18.0%	7.1%	11.5%
Don't know	2.8%	7.3%	4.7%	4.5	4.8%

n = 992, missing cases = 98

safety concerns close behind (39.1%). Conflict ranked fourth at 5.9% of responses (Table 33).

TABLE 31 *1999 State Park Intercept*: Why Respondents Support Use Limits

	Lake/Reservoir				
Why are limits needed?	Deer Creek	Jordanelle	Willard Bay	East Canyon	Overall
Crowding	37.5%	41.6%	38.0%	43.8%	40.4%
Safety	37.8%	36.1%	34.9%	34.7%	36.0%
Experience quality	11.2%	14.5%	6.3%	13.2%	11.8%
Conflict	7.7%	4.2%	12.0%	4.9%	6.7%
Inability of facilities to accommodate use level	1.9%	1.0%	6.3%	1.0%	2.2%
Biophysical impacts	2.9%	1.9%	2.1%	1.0%	2.0%
Misc.	1.0%	.6%	.5%	1.4%	.9%

Note. The unit of analysis is valid responses rather than respondents (1102 responses from 646 respondents).

TABLE 32 *2001 State Park Intercept*: Respondents' Feelings About the Need for Use Limits

	Lake/Reservoir				
Need to limit number of boats?	Hyrum	Echo	Pineview	Bear Lake	Overall
Definitely yes	60.9%	43.4%	70.3%	8.9%	49.0%
Probably yes	16.3%	13.4%	9.5%	4.0%	10.6%
Probably no	2.0%	4.3%	2.5%	4.5%	3.2%
Definitely no	18.8%	37.4%	15.5%	81.7%	35.5%
Don't know	2.0%	1.6%	2.2%	1.0%	1.8%

n = 908, missing cases = 4

TABLE 33 *2001 State Park Intercept*: Why Respondents Support Use Limits

	Lake/Reservoir				
Why are limits needed?	Hyrum	Echo	Pineview	Bear Lake	Overall
Crowding	46.0%	49.5%	39.5%	43.9%	43.6%
Safety	35.9%	34.8%	42.5%	43.9%	39.1%
Experience quality	10.4%	10.6%	9.5%	2.4%	9.7%
Conflict	6.7%	4.5%	6.0%	4.9%	5.9%
Biophysical impacts	.7%	.0%	1.3%	2.4%	.9%
Inability of facilities to accommodate use level	.3%	.0%	.0%	.0%	.1%
Misc.	.0%	.5%	1.1%	2.4%	.7%

Note. The unit of analysis is valid responses rather than respondents (1000 responses from 540 respondents).

2001 Mystic Lakes Boater Intercept Survey
(includes slipholder mail survey results)

In contrast to the Utah state parks, only 21.5% of surveyed Mystic Lakes recreationists probably or definitely supported use limits, while 71.7% did not (Table 34). For those who did support limits, crowding ranked first as a rationale (53.9%) with safety ranking second but figuring somewhat lower than in the Utah state parks results at 24.7% of responses. Conflict was the third most common response (16.9%). Some differences are notable between the two water bodies such as the greater prevalence of conflict at Pactola Reservoir (Table 35).

TABLE 34 *2001 Mystic Lakes Boater Intercept*: Respondents' Feelings About the Need for Use Limits

	Lake/Reservoir		
Need to limit number of boats?	Sheridan	Pactola	Overall
Definitely yes	2.6%	5.6%	4.8%
Probably yes	19.2%	15.8%	16.7%
Probably no	52.6%	34.9%	39.6%
Definitely no	19.2%	36.7%	32.1%
Don't know	6.4%	7.0%	6.8%

n = 293, missing cases = 10

TABLE 35 *2001 Mystic Lakes Boater Intercept*: Why Respondents Support Use Limits

	Lake/Reservoir		
Why are limits needed?	Sheridan	Pactola	Overall
Crowding	65.0%	50.7%	53.9%
Safety	30.0%	23.2%	24.7%
Conflict	5.0%	20.3%	16.9%
Inability of facilities to accommodate use level	.0%	2.9%	2.2%
Experience quality	.0%	1.4%	1.1%
Biophysical impacts	.0%	1.4%	1.1%

Note. The unit of analysis is valid responses rather than respondents (89 responses from 60 respondents).

2001 Mystic Lakes Recreation Intercept Survey (non-boaters)

In surveys taken at Mystic Lakes campsites, even fewer respondents favored use limits: 12.5% probably or definitely supported limits, while 80.2% did not (Table 36). Crowding again topped the list at 57.1% of the responses, followed by safety concerns at 28.6%, and conflict and biophysical impacts, both at 7.1% (Table 37).

2001 South Fork of the Snake River Boater Intercept Survey

Respondents probably or definitely favoring use limits accounted for 25.0% of the sample of South Fork boaters with 68.6% probably or definitely against (Table 38). For those favoring limits, conflict was a dominant reason (40.3% overall; 16.1% being specifically conflict with outfitters/guides) followed by crowding (24.2%) (Table 39).

TABLE 36 *2001 Mystic Lakes Recreation Intercept*: Respondents' Feelings About the Need for Use Limits

	Lake/Reservoir		
Need to limit number of people?	Sheridan	Pactola	Overall
Definitely yes	4.2%	1.0%	2.6%
Probably yes	9.5%	10.3%	9.9%
Probably no	48.4%	37.1%	42.7%
Definitely no	32.6%	42.3%	37.5%
Don't know	5.3%	9.3%	7.3%

n = 192, missing cases = 34

TABLE 37 *2001 Mystic Lakes Recreation Intercept*: Why Respondents Support Use Limits

	Lake/Reservoir		
Why are limits needed?	Sheridan	Pactola	Overall
Crowding	68.8%	41.7%	57.1%
Safety	25.0%	33.3%	28.6%
Conflict	.0%	16.7%	7.1%
Biophysical impacts	6.3%	8.3%	7.1%

Note. The unit of analysis is valid responses rather than respondents (28 responses from 21 respondents).

TABLE 38 *2001 S. Fk. Snake River Boater Intercept*: Respondents' Feelings About the Need for Use Limits

Need to limit number of people?	%
Definitely yes	9.6%
Probably yes	15.4%
Probably no	40.4%
Definitely no	28.2%
Don't know	6.3%

n = 1031, missing cases = 82

TABLE 39 *2001 S. Fk. Snake River Boater Intercept*: Why Respondents Support Use Limits

Why are limits needed?	%
Crowding	26.2%
Conflict	24.2%
Conflict with outfitters	16.1%
Protect fishery	15.8%
Biophysical impacts	11.1%
Experience quality	4.7%
Safety	1.3%
Inability of facilities to accommodate use level	.7%

Note. The unit of analysis is valid responses rather than respondents (298 responses from 217 respondents).

Many of the remaining reasons dealt with the biophysical and fishery impacts of recreational use (26.9% overall).

2001 South Fork of the Snake River Camper Intercept Survey

For South Fork campers, 20.2% probably or definitely favored use limits and 73.0% did not (Table 40). Crowding was the primary reason support (42.1%), followed by biophysical impacts (36.8%) and conflict (21.1%) (Table 41).

TABLE 40 *2001 S. Fk. Snake River Camper Intercept*: Respondents' Feelings About the Need for Use Limits

Need to limit number of people?	%
Definitely yes	2.2%
Probably yes	18.0%
Probably no	57.3%
Definitely no	15.7%
Don't know	6.7%

n = 89, missing cases = 12

TABLE 41 *2001 S. Fk. Snake River Camper Intercept*: Why Respondents Support Use Limits

Why are limits needed?	%
Crowding	42.1%
Biophysical impacts	36.8%
Conflict	21.1%

Note. The unit of analysis is valid responses rather than respondents (19 responses from 14 respondents).

2001 Utah River Study Mail Survey

The *Utah River Study Mail Survey* only asked respondents if they favored use limits if they had reported perceived crowding. Therefore, results are not directly comparable with those from other component studies. Of crowded respondents, 63.8% probably or definitely favored use limits and 21.3% did not (Table 42). Crowding was the primary reason use limits were supported (44.3%) with biophysical impacts following (26.4%). Recreational conflict was given as a reason in 13.2% of responses when general conflict and conflict with outfitters are taken together (Table 43).

2004 Grand Staircase-Escalante National Monument Visitor Intercept Survey

Respondents to this survey had only "yes" and "no" response categories for their support for use limits. "Yes" responses accounted for 9.9% of respondents while 88.5% gave "no" responses (Table 44). Of the respondents who gave "yes" responses, 62.7% attributed this to crowding, while 19.6% cited realized and potential biophysical impacts (Table 45). The unit of analysis here was the respondent as each gave only one response.

TABLE 42 *2001 Utah River Study Mail Survey*: Respondents' Feelings About the Need for Use Limits

Need to limit number of people?[1]	%
Definitely yes	14.8%
Probably yes	59.0%
Probably no	16.4%
Definitely no	4.9%
Don't know	4.9%

n = 122, missing cases = 35

[1]asked only of respondents reporting perceived crowding.

TABLE 43 *2001 Utah River Study Mail Survey*: Why Respondents Support Use Limits

Why are limits needed?	%
Crowding	44.3%
Biophysical impacts	26.4%
Conflict with outfitters	7.5%
Experience quality	7.5%
Objections to large group sizes	6.6%
Conflict	5.7%
Protect fishery	1.9%

Note. The unit of analysis is valid responses rather than respondents (106 responses from 82 respondents).

TABLE 44 *2004 GSENM Intercept*: Respondents' Feelings About the Need for Use Limits

Need to limit number of people?	%
Yes	9.9%
No	88.5%
Don't Know	1.6%

n = 567, missing cases = 6

TABLE 45 *2004 GSENM Intercept*: Why Respondents Support Use Limits

Why are limits needed?	%
Crowding	62.7%
Biophysical impacts	19.6%
Misc.	15.7%
Unsure	2.0%

n = 51, missing cases = 5, not applicable = 522 (unit of analysis is respondent)

2006 Saint Anthony Sand Dunes Intercept Survey

Respondents were queried about their support for use limits regarding three areas: (1) the open dunes area, (2) the trails outside the open dunes, and (3) in campgrounds.On the open dunes, only 9.4% of respondents probably or definitely favored use limits, while 87.9% did not. On the trails, 100.0% did not favor use limits. In the campgrounds, 11.3% probably or definitely favored limits and 86.4% did not (Table 46). Responses for the open dunes most often pertained to safety concerns (54.7%), followed by crowding (32.1%), and conflict (11.3%) (Table 47). For the campgrounds, responses were most frequently related to crowding (52.2%), followed by safety (21.7%), and the inability of

TABLE 46 *2006 SASD Intercept*: Respondents' Feelings About the Need for Use Limits

	Area		
Need to limit number of people?	Open Dunes	Trails	Campgrounds
Definitely yes	1.0%	.0%	.6%
Probably yes	8.4%	.0%	10.7%
Probably no	19.3%	17.1%	23.1%
Definitely no	68.6%	82.9%	63.3%
Don't know	2.7%	.0%	2.4%
	n = 522, not applicable = 112, missing = 9	n = 41, not applicable = 589, missing = 13	n = 169, not applicable = 372, missing = 101

TABLE 47 *2006 SASD Intercept*: *Open Dunes*: Why Respondents Support Use Limits

Why are limits needed?	%
Safety	54.7%
Crowding	32.1%
Conflict	11.3%
Misc.	1.9%

Note. The unit of analysis is valid responses rather than respondents (53 responses from 48 respondents).

TABLE 48 *2006 SASD Intercept*: *Campgrounds*: Why Respondents Support Use Limits

Why are limits needed?	%
Crowding	52.2%
Safety	21.7%
Inability of facilities to accommodate use levels	17.4%
Conflict	8.7%

Note. The unit of analysis is valid responses rather than respondents (23 responses from 17 respondents).

the campgrounds and related facilities to accommodate high use levels (17.4%) (Table 48).

1999 Utah State Park Boater Telephone Survey

Results from this telephone survey of registered Utah boat owners were roughly comparable to results from the state park intercept survey of the same year. Those probably or definitely supporting limits amount to 61.4% of the sample with those probably or definitely opposing limits adding up to 29.7% (Table 49). For reasons for favoring use limits, 46.8% of responses identified safety concerns, with perceived crowding following at 38.6%. Conflict ranked fifth among reasons at just 1.5% of responses (Table 50).

2006 Utah State Park Boater Telephone Survey

In the 2006 version of this telephone survey, 65.0% of respondents probably or definitely supported use limits and 29.7% did not (Table 51). The foremost reason

TABLE 49 *1999 State Park Boater Telephone Survey*: Respondents' Feelings About the Need for Use Limits

Need to limit number of people?	%
Definitely yes	24.6%
Probably yes	39.9%
Probably no	22.8%
Definitely no	8.4%
Don't know	4.2%

n = 333, missing cases = 17

TABLE 50 *1999 State Park Boater Telephone Survey*: Why Respondents Support Use Limits

Why are limits needed?	%
Safety	46.8%
Crowding	38.6%
Experience quality	9.4%
Biophysical impacts	1.9%
Conflict	1.5%
Ability of facilities to accommodate use	1.1%
Misc.	.7%

Note. The unit of analysis is valid responses rather than respondents (267 responses from 205 respondents).

mentioned for support was perceived crowding (45.2% of responses), followed by safety (40.4%), and conflict (7.9%) (Table 52).

Multivariate Analyses

For the most part, results of the multivariate analyses consist of two components: 1) an OLS or logistic regression model using perceived crowding as a dependent variable; and 2) an OLS or logistic regression model using support for use limits as a

TABLE 51 *2006 State Park Boater Telephone Survey*: Respondents' Feelings About the Need for Use Limits

Need to limit number of people?	%
Definitely yes	29.5%
Probably yes	35.5%
Probably no	17.4%
Definitely no	12.3%
Don't know	5.3%

n = 397, missing cases = 0

TABLE 52 *2006 State Park Boater Telephone Survey*: Why Respondents Support Use Limits

Why are limits needed?	%
Crowding	45.2%
Safety	40.4%
Conflict	7.9%
Experience quality	2.7%
Ability of facilities to accommodate use	1.7%
Biophysical impacts	.7%
Misc.	.7%
Missing/uninterpretable	.7%

Note. The unit of analysis is valid responses rather than respondents (292 responses from 258 respondents).

dependent variable. OLS models were selected for ordinal dependent variables, while logistic models were selected for dichotomous dependent variables. Results are organized by component study. Information necessary for interpretation of OLS and logistic regression coefficients was obtained from Knoke et al. (2002). Information on interpretation of pseudo R^2 in logistic regression was taken from Knoke et al. and University of California, Los Angeles, Academic Technology Service (n.d.). The first component survey is explained in somewhat greater detail with regard to interpretations of regression coefficients, while interpretation of subsequent regression models follow the same form and requires less explicit discussion.

1999 State Park Intercept Survey

For this data set, the logistic regression model for the perceived crowding dependent variable produced a Nagelkerke pseudo R^2 of .247 (Table 53). This roughly indicates 24.7% of the variation in perceived crowding is predicted by the model's independent variables. Assuming the accuracy of this approximation, this is one of the better explanatory models amongst the component data sets. Several independent variables were statistically significant. First, parking lot fullness, the only indicator of use level available in this data set, showed a relatively strong correlation with perceived crowding. Each unit increase in lot fullness, as measured by a four-point scale, corresponded to a 72.6% increase in the likelihood of a respondent reporting crowding (Exp(b) = .726). Of an almost equal magnitude, was the frequency of conflict independent variable. Also measured by a four-point scale, a unit increase in this variable corresponded to a 70.8% greater likelihood of perceived crowding. Water body

TABLE 53 *1999 State Park Intercept*: Logistic Regression for Perceived Crowding Dependent Variable

Independent Variables	b	S.E.	Exp(b)
constant	-1.856***	.565	.156
Sex	-.058	.258	.944
Age	-.037***	.009	.964
Number in group	.027*	.013	1.027
Visited before (y/n)	-.146	.377	.864
Number of years visiting	.006	.011	1.006
Frequency of conflict	.535***	.090	1.708
Surface area in100s of acres	-.019***	.004	.982
Parking lot fullness	.546***	.086	1.726
	Nagelkerke R^2 = .247		

*p ≤ .05; **p ≤ .01; ***p ≤ .001.

size was also correlated with perceived crowding with a 1.8% lower likelihood of perceived crowding per 100 acres of surface area. Respondent age showed a negative correlation with perceived crowding where a unit increase (one year) in age corresponded to 3.6% less likelihood of reporting crowding. Next, increases in group size were (contrary to expectations) associated with increased likelihoods of perceived crowding (2.7% greater likelihood per individual in the group). Variables not statistically significant were sex, whether or not respondents were first-time visitors, and the number of years they had been visiting the surveyed water body.

The change in pseudo R^2 that corresponded to the addition of the parking lot fullness variable as the final variable entered into the model was .071. Thus, controlling for other factors, introduction of this surrogate for use level corresponded to 7.1% increase in the predictive ability of the model relative to whether or not respondents reported perceived crowding.

The OLS regression model for the support for use limits dependent variable was far less powerful with only 8.4% (R^2 = .084) of variation in this variable accounted for by

TABLE 54 *1999 State Park Intercept*: OLS Regression for Support for Use Limits Dependent Variable

Independent Variables	b	S.E.	β
constant	4.273***	.284	
Sex	.154	.123	.039
Age	-.008*	.004	-.071
Number in group	.016*	.007	.072
Visited before (y/n)	.160	.172	.030
Number of years visiting	-.011*	.005	-.078
Frequency of conflict	.139***	.043	.105
Surface area in100s of acres	-.009***	.001	-.212
Parking lot fullness	-.050	.037	-.043
Perceived crowding	-.137	.131	-.035
	R^2 = .084		

*p ≤ .05; **p ≤ .01; ***p ≤ .001

the model (Table 54). The strongest explanatory variable, in terms of standardized regression coefficient (β = -.212), was the size of the lake or reservoir at which the respondent was surveyed. Standardized regression coefficients (β) indicate the increase or decrease in the dependent variable, in standard deviations, per standard deviation increase in the independent variable (Knoke et al., 2002). The unstandardized coefficient (b) for this variable indicated a 100 acre increase in surface area corresponded to only a .009 decrease in support for use limits on the 5-point scale used. In other words, a 10,000-acre increase in size would correspond to just under a 1-point estimated decrease in the 5-point use limit support variable. Also statistically significant was respondents' frequency of conflict, though of a lower magnitude, measured by standardized regression coefficient, than surface area (β = .105). A 1-point increase in the 4-point conflict variable corresponds to an estimated .139 point decrease in the support for limits variable.

The longer the length of time respondents had been visiting the water body, the less likely they were to support limits. For every year visiting, a respondent was

estimated to be .011 points less favorable towards use limits. Older respondents showed less support for limits. This was estimated at .008 points per year of age. Respondents in larger groups, however, were more correlated with support for use limits: an estimated .016 points more favorable per additional individual in the respondent's group. Variables not statistically significant were sex, whether a respondent had visited before, parking lot fullness, and most notably, perceived crowding.

2001 State Park Intercept Survey

The pseudo R^2 for this logistic regression model indicated roughly 13.2% of variation in the perceived crowding dependent variable was predicted by the model's independent variables (Nagelkerke pseudo $R^2 = .132$) (Table 55). The statistically significant independent variable of largest magnitude for this logistic regression model was parking lot fullness (b = .682). Also, the more frequently respondents had experienced conflict the more likely they were to report crowding. The larger the water body, the lower the likelihood of respondents reporting perceived crowding. No other independent variable was statistically significant.

TABLE 55 *2001 State Park Intercept*: Logistic Regression for Perceived Crowding Dependent Variable

Independent Variables	b	S.E.	Exp(b)
constant	-3.573***	.651	.028
Sex	.070	.266	1.073
Age	-.015	.010	.985
Number in group	.018	.016	1.018
Visited before (y/n)	.126	.398	1.134
Number of years visiting	-.002	.011	.998
Frequency of conflict	.375***	.098	1.455
Surface area in100s of acres	-.001**	.001	.999
Parking lot fullness	.682***	.140	1.978
	Nagelkerke $R^2 = .132$		

*p ≤ .05; **p ≤ .01; ***p ≤ .001

The change in pseudo R^2 with the addition of the parking lot fullness variable, controlled for other model variables, was .057.

The OLS regression model for respondents' support for use limits produced an R^2 indicating 30.1% of the variation in the dependent variable was statistically explained by the model variables (Table 56). Only two independent variables were statistically significant, however: water body surface area with larger size equating to lower support for limits (β = -.507); and the frequency at which respondents experienced conflict with more conflict corresponding to higher support for use limits (β = .133) .

2001 South Fork of the Snake River Boater Survey

For this data set, an OLS regression model was constructed for the five-point perceived crowding dependent variable. The model statistically explained 18.4% of the variation in the dependent variable (Table 57). The strongest explanatory variable was respondents' estimates of the number of other people they encountered on the river (β = .261) with more people associated with more perceived crowding. The parking lot

TABLE 56 *2001 State Park Intercept*: OLS Regression for Support for Use Limits Dependent Variable

Independent Variables	b	S.E.	β
constant	4.243***	.332	
Sex	.159	.127	.036
Age	-.003	.004	-.018
Number in group	-.002	.008	-.007
Visited before (y/n)	-.239	.185	-.041
Number of years visiting	-.001	.005	-.004
Frequency of conflict	.207***	.047	.133
Surface area in100s of acres	-.003***	.000	-.507
Parking lot fullness	-.051	.050	-.030
Perceived crowding	-.103	.171	-.018
	R^2 = .301		

*p ≤ .05; **p ≤ .01; ***p ≤ .001

TABLE 57 *2001 S. Fk. Snake River Boaters*: OLS Regression for Perceived Crowding Dependent Variable

Independent Variables	b	S.E.	β
constant	2.775***	.137	
Sex	-.029	.054	-.018
Age	-.003	.002	-.052
With commercial outfitter (y/n)	.072	.073	.034
Number in group	-.004	.005	-.029
Number of years visiting	.004*	.002	.073
Conflict (y/n)	.107	.060	.069
Shore fishing (y/n)	.004	.046	.003
Boat fishing (y/n)	.003	.074	.001
Problem –motorized watercraft	.049*	.022	.089
Problem –inconsiderate boaters	.026	.030	.035
Problem –too many people at take-out	.159***	.034	.174
Est. number of people encountered	.005***	.001	.261
Parking lot fullness	.043*	.018	.080
	R^2 = .184		

*p ≤ .05; **p ≤ .01; ***p ≤ .001

fullness measure of crowding was also statistically significant, with an association in the same direction, though the effect was not of as great a magnitude as judged by standardized regression coefficients. The degree to which location-specific crowding at take-outs was deemed a problem was also statistically significantly related to perceived crowding. Though this is to be expected, it may be indicative of the degree to which mitigating congestion at specific points, rather than limiting use overall, can be effective in managing perceived crowding. On the other hand, it may be a matter of higher use levels being an antecedent to both take-out congestion and overall visitor perceptions of crowding.

The degree to which respondents identified motorized watercraft as a problem also showed statistical significance in its association with the dependent variable (β = .089). Although the conflict dummy variable did not reach the level of statistical

significance in its association with perceived crowding ($p = .075$), it was rather close to the .05 level. It does not appear to be as strong an indicator ($\beta = .069$) as the ordinal conflict variables in the two Utah state park logistic regression models for perceived crowding dependent variables.

The number of years respondents had been visiting the area showed a statistically significant association with perceived crowding, unlike in the Utah state park intercept surveys. Here, recreationists with a longer term relationship with the South Fork of the Snake River were more likely to experience crowding ($\beta = .073$).

Change in R^2 corresponding to the addition of the two use level variables (estimated number of people encountered and parking lot fullness) was .077. The visitor use level estimate yielded a .071 change, while the parking lot fullness variable, added subsequently, brought an additional .006 to the R^2 value, controlled for all other model variables.

The support for use limits dependent variable was also analyzed with an OLS regression model producing an estimation of statistical explanation of 17.8% of the variation in this dependent variable (Table 58). Perceived crowding proved statistically significant and the most powerful explanatory variable in the model ($\beta = .225$). A one point increase in the four-point perceived crowding scale (the two "too few" categories were collapsed into one due to infrequency of cases for use as an independent variable in this model) was estimated to correspond to a little less than a one half point increase in the five-point support for use limits scale. Interestingly, visitor estimates of use level were not statistically significant, while parking lot fullness showed a positive relationship with the dependent variable and was statistically significant at the .05 level. This is a

TABLE 58 *2001 S. Fk. Snake River Boaters*: OLS Regression for Support for Use Limits Dependent Variable

Independent Variables	b	S.E.	β
constant	1.165***	.280	
Sex	.040	.099	.014
Age	-.004	.003	-.044
With commercial outfitter (y/n)	.535***	.133	.138
Number in group	.001	.010	.004
Number of years visiting	-.008*	.004	-.077
Conflict (y/n)	.134	.110	.047
Shore fishing (y/n)	-.065	.085	-.026
Boat fishing (y/n)	-.017	.137	-.005
Problem –motorized watercraft	.137***	.040	.136
Problem –inconsiderate boaters	.019	.055	.014
Problem –too many people at take-out	.229***	.063	.137
Est. number of people encountered	-.001	.001	-.035
Parking lot fullness	-.094**	.034	-.094
Perceived Crowding	.418***	.067	.225
	$R^2 = .178$		

*p ≤ .05; **p ≤ .01; ***p ≤ .001

reversal from the relationships in the perceived crowding regression model for this data set where estimated use level was the better explanatory variable. The degree to which localized congestion at take-outs was identified as a problem also showed a statistically significant positive relationship with use limit support.

Although the conflict dummy variable was not statistically significant, the ordinal variable measuring the degree to which respondents felt motorized watercraft use was a problem was, with a relatively large β value of .136. In addition, respondents using the services of commercial outfitters appear to be somewhat more favorable to use limits, according to this regression model. Lastly, in a similar manner to the *1999 State* Park data set, the length of time respondents have been coming to the area has a negative, statistically significant correlation with favorability towards use limits.

Although this survey did not include a support for use limits variable, it contained perceived crowding variables; one related to numbers of people seen and one focused on the numbers of watercraft. Displayed here are regression models for the perceived crowding dependent variable relating to numbers of people as well as the interactive dependent variable constructed from both perceived crowding measures as described in Chapter 3: Methods.

The regression model describing perceived crowding relative to numbers of people statistically explained 5.9% of the variation in the dependent variable (Table 59). The independent variables for both the estimated number of people and watercraft were positively associated with scores on this perceived crowding rating and statistically significant. The watercraft-related variable produced a substantially larger standardized coefficient (β = .171) than the people-related coefficient (β = .093). Sex was also statistically significant, unlike previously described regression models, with women somewhat more prone to report perceived crowding than men.

TABLE 59 *2001 Utah River Study Intercept*: OLS Regression for Perceived Crowding (People) Dependent Variable

Independent Variables	b	S.E.	β
constant	2.857***	.105	
Sex	.101**	.034	.066
Age	.004	.013	.007
With commercial outfitter (y/n)	.014	.038	.009
Visited segment before (y/n)	.000	.037	.000
Number in group	-.001	.001	-.024
Est. number of watercraft encountered	.007***	.001	.171
Est. number of people encountered	.001***	.000	.093
	R^2 = .059		

*p ≤ .05; **p ≤ .01; ***p ≤ .001

The change in R^2 value corresponding to addition of the two estimated use level variables was .054. The addition of the estimated number of watercraft variable added .047 while the number of people-based version of the variable added an additional .007, controlled for all other model variables.

The interactive perceived crowding dependent variable produced a larger R^2 than the people-related perceived crowding variable (R^2 = .088) (Table 60). The same independent variables showed statistical significance, at close to the same standardized coefficient values, with two notable exceptions. The standardized coefficient for visitor estimates of the number of people encountered which was somewhat larger (β = .139) and visitors who had visited before tended to be statistically significantly more crowded (β = .051).

2001 Utah River Study Mail Survey

This regression model is substantially different from other component studies inasmuch as it makes use of on-site estimates of use level, while all other survey

TABLE 60 *2001 Utah River Study Intercept*: OLS Regression for Perceived Crowding (Interactive) Dependent Variable

Independent Variables	b	S.E.	β
constant	6.283***	.354	
Sex	.333**	.114	.064
Age	-.013	.043	-.007
With commercial outfitter (y/n)	-.103	.129	-.018
Visited segment before (y/n)	.276*	.126	.051
Number in group	-.005	.004	-.026
Est. number of watercraft encountered	.028***	.004	.192
Est. number of people encountered	.007***	.001	.139
	R^2 = .088		

*p ≤ .05; **p ≤ .01; ***p ≤ .001

questions were answered later, off-site. The regression model (for the perceived crowding dependent variable) was the most powerful model in terms of R^2 of all component studies ($R^2 = .359$), indicating nearly 36% of the variation in perceived crowding responses is statistically explained by the model's independent variables (Table 61). Despite this, neither on-site estimate of use level approached statistical significance, unlike other models where use level was consistently important.

The strongest explanatory variable was the degree to which respondents thought large groups were a problem ($\beta = .380$). This positive association may indicate that the size of groups is a larger problem to solitude-seeking, or otherwise crowded recreationists, than is the number of encounters, at least in a river running setting. Two potential problems, evaluated by respondents on four-point scales, were positively associated with perceived crowding concerning numbers of people encountered: congestion at take-outs ($\beta = .132$) and conflicts between groups of boaters ($\beta = .137$). Of the demographic independent variables, only one was statistically significant at or below the .05 level: education level. A higher education level was associated with respondents reporting crowding. Of the two REP solitude scale items, only one, the more explicitly stated importance to the respondent of "getting away from the crowds," was statistically significant ($\beta = .155$), while the "importance of solitude" item was not. In addition, the independent variable in which respondents rated human-caused biophysical impacts on a five-point scale was positively correlated with perceived crowding and it closely approached statistical significance at the .05 level ($p = .052$). The fishing dummy variable also came near statistical significance at this level ($p = .078$).

TABLE 61 *2001 Utah River Study Mail Survey*: OLS Regression for Perceived Crowding Dependent Variable

Independent Variables	b	S.E.	β
constant	2.074***	.155	
Sex	.056	.045	.055
Age	.001	.002	.014
Education level	.048***	.014	.154
Size of residential area inhabited for most of life	.001	.012	.004
Tot. household income	-.002	.007	-.013
Number adults in group	-.003	.003	-.037
Number of times floated segment before	-.001	.001	-.054
REP—importance of solitude	-.010	.017	-.033
REP—importance of getting away from the crowds	.052**	.019	.155
Degree of human-caused physical impacts	.051	.026	.096
Problem—too many motorized watercraft	-.063	.037	-.074
Problem—litter	-.023	.036	-.033
Problem—vegetation loss	.027	.033	.042
Problem—waiting at rapids	.021	.054	.018
Problem—inexperienced boaters	-.067	.046	-.069
Problem—rude boaters	-.028	.048	-.032
Problem—conflict between groups	.138**	.053	.137
Problem—water pollution	-.040	.039	-.048
Problem—large groups	.249***	.035	.380
Problem—too many people at take-outs	.081**	.028	.132
Fishing dummy (y/n)	.130	.073	.079
Est. number of watercraft encountered	.000	.001	.021
Est. number of people encountered	.000	.000	.032
	R^2 = .359		

*p ≤ .05; **p ≤ .01; ***p ≤ .001

2004 Grand Staircase-Escalante National Monument Intercept Survey

The OLS regression model for the perceived crowding dependent variable statistically explained 20.2% of the dependent variable variation (Table 62). Several variables were statistically significant. The strongest independent variable (β = .254) was

TABLE 62 *2004 GSENM Intercept*: OLS Regression for Perceived Crowding Dependent Variable

Independent Variables	b	S.E.	β
constant	2.717***	.139	
Sex	.020	.054	.016
Age	-.006***	.002	-.145
Number in group	-.006	.008	-.033
Visited before (y/n)	.068	.063	.049
Number of years visiting	.008***	.002	.154
Use density expected vs. use density observed	.206***	.037	.254
Number of people encountered	.006***	.002	.181
Parking lot fullness	.064*	.027	.112
	R^2 = .202		

*p ≤ .05; **p ≤ .01; ***p ≤ .001

the three-point measure of whether respondents expectations about use levels were fallen short of, met, or exceeded. This positive correlation indicated respondents whose expectations fell short of observed use densities tended more towards the "too few" perceived crowding responses while those whose expectations were exceeded tended towards "too many" responses. Both estimations of numbers of encounters (β = .181) and the parking lot fullness (β = .112) variables were statistically significant with the encounter estimations again showing a standardized coefficient of a greater magnitude. The number of years respondents had visited a site was also statistically significant and positively associated with perceived crowding (β = .154). Age showed a statistically significant negative association (β = -.145) with older respondents less likely to report crowding.

Addition of the two use level independent variables into the regression model precipitated a change of .053 in R^2 value. Respondents' estimated numbers of encounters brought the R^2 value up by .043 and parking lot fullness added a further .010, controlled for all other model variables.

The dichotomous support for use limits survey question used in this study necessitated the use of a logistic regression model for this dependent variable. The pseudo-R^2 obtained indicates approximately 9.9% of the variation in respondents' support for use limits is predicted by the independent variables (Table 63). Only one independent variable was statistically significant: parking lot fullness (Exp(b) = 1.947). It should be cautioned that a few specific sites had tendencies toward higher parking lot densities than the rest of the GSENM survey sites, which tended to be relatively empty. This statistical significance may therefore be more reflective of greater support for limits at these sites rather than a reflection of a correlation between varying use levels observed at survey sites and corresponding support for or opposition to use limits.

2004 Grand Staircase-Escalante National Monument Mail Survey

Only an OLS regression model for the perceived crowding dependent variable was created for this data set (see Chapter 3: Methods). This model made use of the REP scale items available in data from respondents who completed the mail-back portion

TABLE 63 *2004 GSENM Intercept*: Logistic Regression for Support for Use Limits Dependent Variable

Independent Variables	b	S.E.	Exp(b)
constant	-3.459***	1.013	.031
Sex	.151	.350	1.163
Age	-.011	.013	.990
Number in group	-.008	.049	.992
Visited before (y/n)	-.166	.411	.847
Number of years visiting	-.014	.020	.986
Use density expected vs. use density observed	.077	.249	1.080
Number of people encountered	-.010	.011	.990
Parking lot fullness	.666***	.160	1.947
Perceived crowding dummy	.180	.487	1.197
	Nagelkerke R^2 = .099		

*p ≤ .05; **p ≤ .01; ***p ≤ .001

of this study. As neither item proved statistically significant, the utility of this regression model is questionable. Nonetheless, trends from the larger, intercept-only data set are generally continued amongst mail survey respondents. The R^2 value was somewhat higher for the more limited data set at .260, compared to .202 in the intercept-only data set (Table 64). With the exception of the parking lot fullness variable, all statistically significant variables from the intercept-only data set were statistically significant here, with associations in the same direction. The parking lot fullness variable approached statistical significance at the .05 level (P = .073). The standardized coefficient for the variable representing the number of years visiting was notably higher in this sample (β = .222, compared to .154 in the larger data set).

Change in R^2 corresponding to the addition of the use level variables is .057. The addition of use level estimates to the model raised the value by .045 and parking lot

TABLE 64 *2004 GSENM Mail Survey*: OLS Regression for Perceived Crowding Dependent Variable

Independent Variables	b	S.E.	β
constant	2.760***	.283	
Sex	.080	.069	.071
Age	-.008**	.003	-.182
Number in group	-.011	.016	-.044
Visited before (y/n)	.011	.082	.009
Number of years visiting	.011***	.003	.222
Use density expected vs. use density observed	.177***	.049	.239
REP—importance of seeing no one outside of group	.050	.035	.093
REP—importance of enjoying quiet and tranquility	-.018	.051	-.023
Number of people encountered	.006**	.002	.198
Parking lot fullness	.060	.033	.116
	R^2 = .260		

*p ≤ .05; **p ≤ .01; ***p ≤ .001

fullness measures raised the value by an additional .012, controlled for all other model variables.

2006 Saint Anthony Sand Dunes Intercept Survey

OLS regression models were constructed for both perceived crowding and support for use limits dependent variables for the SASD data set. For the perceived crowding regression model, the R^2 value of .026 was lower than any other regression model used in this thesis project (Table 65). Only one independent variable in the model, respondents' estimates of the number of people encountered, showed statistical significance at the .05 level ($\beta = .113$). None of the REP scale items approached statistical significance, nor did the use level expectations independent variable that proved such a strong explanatory

TABLE 65 *2006 SASD Intercept*: OLS Regression for Perceived Crowding Dependent Variable

Independent Variables	b	S.E.	β
constant	2.682***	.290	
Sex	-.029	.102	-.016
Age	.003	.003	.053
Number in group	-.004	.005	-.045
Number of years visiting	.001	.004	.015
Skill level	-.018	.051	-.020
Use density expected vs. use density observed	.050	.083	.032
Conflict with motorized users	.054	.043	.067
REP—importance of getting away from it all	-.004	.038	-.006
REP—importance of finding solitude	-.006	.030	-.014
REP—importance of finding peace and quiet	-.012	.028	-.027
Number of people encountered (on the open dunes area)	.001*	.000	.113
	$R^2 = .026$		

*p ≤ .05; **p ≤ .01; ***p ≤ .001

variable in the *GSENM intercept survey* regression model for the perceived crowding dependent variable.

Change in R^2 value with the addition of the use level estimate independent variable was .012, though it should be remembered that this was, in fact, the only model variable that even approached statistical significance at the .05 level. Thus, evaluating this variable relative to other model variables serves little purpose here.

For the support for use limits dependent variable, the model's R^2 value was .071. Two regression model variables were statistically significant (Table 66). First, age showed a statistically significant, positive relationship with support for use limits. Older respondents were more inclined to support use rationing, according to the model. Second, the variable reflecting respondents' use level expectations was statistically significant at the .05 level. Notably this was not statistically significant in explaining

TABLE 66 *2006 SASD Intercept*: OLS Regression for Support for Use Limits Dependent Variable

Independent Variables	b	S.E.	β
Constant	.436	.399	
Sex	-.126	.126	-.055
Age	.011**	.004	.157
Number in group	-.004	.006	-.040
Number of years visiting	-.002	.004	-.021
Skill level	-.029	.063	-.025
Use density expected vs. use density observed	.235*	.102	.120
Conflict with motorized users	.095	.053	.093
REP—importance of getting away from it all	-.014	.047	-.016
REP—importance of finding solitude	.054	.037	.091
REP—importance of finding peace and quiet	.006	.035	.010
Number of people encountered (on the open dunes area)	.000	.000	.002
Perceived crowding	.048	.066	.038
	$R^2 = .071$		

*p ≤ .05; **p ≤ .01; ***p ≤ .001

perceived crowding. Apparently, respondents who see more other visitors than expected tend to support the implementation of use limits, while those whose expectations are matched are less inclined, and those who see fewer than expected, tend to be even less supportive.

CHAPTER 5

SYNTHESIS AND DISCUSSION

Due to the large amount of data and the number of individual studies incorporated into this thesis research, some summary seems in order so that trends in the results and usable management implications might be revealed. This will begin with summarization and discussion of the three bivariate/univariate analyses and then proceed to the multiple regression models for both dependent variables used.

Correlation Between Perceived Crowding and Satisfaction

The most notable feature of this portion of the study results was the uniformly high levels of visitor satisfaction. This result was not unanticipated based on the literature reviewed (e.g. Manning, 1999; Stewart & Cole, 2001). Perceived crowding levels vary substantially but none exceed the crowded 36.7% (34.9% when missing data is taken account of) of boaters on the South Fork of the Snake River (Table 67). This is, moreover, the only study that exceeds (and barely exceeds, at that) the rather arbitrary 33% or less reporting crowding standard set by Shelby and Heberlein (1986) for a below-capacity recreation area. Though admittedly this thesis research uses a different scale, perceived crowding measures are ultimately used in both studies in the same dichotomous manner.

In looking at management standards for visitor satisfaction, all studies exceed the 80% satisfaction rate suggested in Mission Goal IIa from the NPS Strategic Plan (Haas, 2001). When missing data is excluded, as in Table 67, all study satisfaction ratings

substantially exceed this level. When missing data is considered, as is appropriate since neutral responses were excluded from crosstabulations (see Chapter 3: Methods), the *1999 Utah State Park* intercept survey has the lowest satisfaction rate at 81.3%, though

TABLE 67 Overview of Study Crosstabulations and Association Between Perceived Crowding and Satisfaction

Study	Dissatisfied[a]	Satisfied[a]	Crowded[a]	Not Crowded[a]	Stat. Sig. χ^2	Cells w/ Insuf. Exp. Values	Valid n
1999 UT St. Pk. Int.	5.1%	94.9%	15.7%	84.3%			928
2001 UT St. Pk. Int.	7.4%	92.6%	11.9%	88.1%	**		893
2001 Mystic Lks. Boat	2.1%	97.9%	10.5%	89.5%	***	1	285
2001 Mystic Lks. Rec.	2.3%	97.7%	4.2%	95.8%		2	215
2001 S. Fk. Snake Boat	2.7%	97.3%	36.7%	63.3%			963
2001 S. Fk. Snake Camp	2.5%	97.5%	12.7%	87.3%		2	79
2001 UT River Int.[b]	.6%	99.4%	20.4%	79.6%		1	2172
2001 UT River Mail	2.3%	97.6%	15.8%	84.2%		1	747
2004 GSENM Int.	.5%	99.5%	15.0%	85.0%		2	567

*p ≤ .05; **p ≤ .01; ***p ≤ .001

[a]Percentages consider only respondents with valid responses for both variables.

[b]Used perceived crowding relative to numbers of people seen dependent variable.

the 9% of responses containing missing data besides neutral responses surely contributes to this relatively low rating.

Results from Pearson chi-square analysis of the correlation between satisfaction and perceived crowding are not entirely conclusive but are not suggestive of a strong or consistent relationship between the two as theorized in reviewed literature, where perceived crowding forms a link between the difficult-to-connect concepts of use density and satisfaction (e.g., Manning, 1999; Shelby & Heberlein, 1986; contradicted by Stewart & Cole, 2001). Of the nine data sets listed in Table 67, only two produced statistically significant Pearson chi-square values. Moreover, the presence of only six dissatisfied respondents in the *Mystic Lakes Boater* data set (four were crowded and two were not, see Chapter 4: Results, Table 9) renders this result less than convincing. On the other hand, the presence of expected values fewer than five in one or more cells in six of the nine chi-squares may have diminished the ability of this statistical test to show association between the variables. Nevertheless, the overarching theme seems to be a general unanimity of satisfied majorities of visitors and no convincing relationship between dissatisfaction and perceived crowding with the possible exceptions of the *2001 Utah State Park*, and *2001 Mystic Lakes Boaters* intercept surveys.

Analysis of open-ended attributions for respondents' dissatisfaction also gave little evidence for a substantial connection between perceived crowding and overall satisfaction. In most of the seven applicable data sets, crowding was not one of the more common responses and was frequently not mentioned by any dissatisfied respondents.

For the *2001 Mystic Lakes Recreation*, *2001South Fork of the Snake River Camper*, and *2004 GSENM* intercept surveys, crowding did not come up as a response.

For the two Utah state park intercept surveys, crowding was a relatively minor stated cause of dissatisfaction. The 1999 data set contained four respondents who cited crowding out of 57 dissatisfied or neutral respondents who gave responses to this question. This is, moreover, from a data set with 1,090 respondents. In 2001, five responses citing crowding were recorded from 65 dissatisfied respondents (85 responses total) out of a data set of 912 respondents.

A more substantial percentage of dissatisfied responses referred to perceived crowding in the 2001 *Mystic Lakes* and *South Fork of the Snake River* boater intercept data sets. At Mystic Lakes, two responses cited crowding out of six dissatisfied respondents (nine responses total) from a data set of 303 respondents. On the South Fork, six respondents cited perceived crowding out of 25 dissatisfied or neutral respondents (34 responses total) from a data set of 1,113 respondents. The focus on angling may help to explain the relative frequency of crowding-related dissatisfaction in this study area. All in all however, these numbers still seem relatively minor, at least when compared to the size of the entire sample.

In addition, other factors seem to consistently outrank crowding in contributing to dissatisfaction. In all four response sets that contain references to perceived crowding, conflict significantly outranks in numbers or responses. (Interestingly, conflict is also absent from the three sets of responses that do not contain references to crowding). The greater prevalence of conflict here may be suggestive of the potential utility of management goals that focus on inter-user conflict rather than those that seek to limit access. Other attributions that outrank crowding tend to deal with factors not under management control. For both Utah state park intercept surveys and the South Fork of

the Snake River boater intercept, lack of angling success was a far greater factor than crowding, as was inclement weather at the state parks.

It is notable that crowding was only mentioned as a cause for dissatisfaction at confined lake/reservoir recreation areas and by boaters on the South Fork of the Snake River. It is impossible to discern whether, in the latter case, this is more related to the focus on recreational fishing or to the nature of boat-related river recreation generally, though it seems likely to be a combination of both. It is interesting that crowding would not be stated as a cause at the camping, hiking, and similar recreation sites at the Mystic Lakes, South Fork, or GSENM, while it would appear, albeit in a relatively minor role, at the boating sites.

While it is difficult to draw definitive conclusions from these open ended responses, it does not seem to suggest any substantive problems with crowding at the study recreation areas, at least insofar as it contributes to respondents reporting actual dissatisfying experiences. This is especially true when this data is set beside the previously described Pearson chi-square analyses of perceived crowding and satisfaction variables. Table 68 below summarizes the overall number and percentage of respondents attributing dissatisfaction to perceived crowding in open-ended responses from each component study.

Frequency of Potential Use Dispersal Due to Use Limits

In order to place results in a regional context as best as possible given the available data, percentages of respondents likely to be dispersed were noted. With the exception of the Mystic Lakes boaters, more than half of respondents from all applicable

TABLE 68 Overall Numbers and Percentages of Respondents Attributing Dissatisfaction to Perceived Crowding in Open-Ended Responses

Study	n Dissatisfied	n Dissatisfied due to crowding	Overall n	% Overall dissatisfied due to crowding
1999 UT State Park Int.	47	4	928	.4%
2001 UT State Park Int.[a]	66	5	893	.6%
2001 Mystic Lakes Boater Int.[a]	6	2	285	.7%
2001 Mystic Lakes Rec. Int.[a]	5	0	215	.0%
2001 S. Fork Snake Boater Int.[a]	26	6	963	.6%
2001 S. Fork Snake Camper Int.[a]	2	0	79	.0%
2004 GSENM Int.	3	0	567	.0%

[a]Although analysis in these studies used *response* rather than *respondent* as the unit of analysis, only a maximum one response describing perceived crowding was recorded from each respondent thereby making valid description of the number and percentage of these respondents

data sets said they would probably or definitely go elsewhere, in pursuit of the same activity if prevented from accessing the survey site due to management use limits (Table 69). As noted previously, the anomalous results from the Mystic Lakes boaters are most likely a result of this being the only comparable recreation option within the Rapid City, South Dakota area. Thus, the potential to disperse "excessive use" from one area to another is at least a hypothetically valid concern. This is especially problematic when use may be diverted from a high use area with no substantive social crowding problems, as could be argued of all the high use areas/sites in this thesis research, to low use sites where crowding-prone recreationists may intentionally recreate to escape these high use densities.

More detailed analyses of the results from the 1999 and 2001 *Utah State Park Boater Intercept* surveys in Reiter et al. (2001[b]) and (2002[a]) indicate respondents show a strong overall tendency for visitors prevented from accessing the survey site to "go to the next nearest lake [offering] similar recreational opportunities" (Reiter et al., 2002[a], p. 36). For these sites, use limits seem to shift crowding "problems" between individual sites

TABLE 69 Percentages of Visitors Likely to Go Elsewhere for the Same Activity if Dispersed by Use Limits

Study	% Likely to Go Elsewhere
1999 Utah State Park Intercept	64.2%
2001 Utah State Park Intercept	63.4%
2001 Mystic Lakes Boater Intercept	20.1%
2001 Mystic Lakes Camper Intercept	55.7%
2001 Utah River Study Mail Survey	51.4%

rather than actually solving the problem. As the majority of the alternate sites mentioned by respondents are also managed by the Utah Division of Parks and Recreation, this is especially apparent.

Do Respondents Support Use Limits Because of Crowding or Because of Conflict and/or Other Factors?

In addressing this question, it is first necessary to observe the relative support of respondents for use limits at the various study sites/areas. Whether large majorities or small minorities of respondents favor limits should, at least to some degree, color interpretation of their stated reasons for favoring these use limits. Table 70 displays this information combining "probably" and "definitely" categories of both "yes" and "no" responses.

The survey areas seem to fall into two distinct groups: Utah state parks reservoirs/lakes and Utah rivers, where limits are favored by large majorities, and all other sites where large majorities do not approve of implementing use limits. Although caution should be used comparing results of intercept, mail, and telephone surveys, it is notable that results from Utah state park intercept and telephone surveys are remarkably

TABLE 70 Percentages of Respondents Supporting Management Use Limits for Study Sites

	Support use limits?			
Study	yes[a]	no[a]	don't know[a]	Valid n
1999 UT State Park Intercept	65.8%	29.3%	4.8%	992
2001 UT State Park Intercept	59.6%	38.7%	1.8%	908
2001 Mystic Lakes Boater Intercept	21.5%	71.7%	6.8%	293
2001 Mystic Lakes Rec. Intercept	12.5%	80.2%	7.3%	192
2001 S. Fork Snake Boater Intercept	25.0%	68.6%	6.3%	1031
2001 S. Fork Snake Camper Intercept	20.2%	73.0%	6.7%	89
2001 UT River Study Mail Survey[b]	73.8%	21.3%	4.9%	122
2004 GSENM Intercept[c]	9.9%	88.5%	1.6%	567
2006 SASD Intercept				
Open dunes	9.4%	87.9%	2.7%	522
Trails	.0%	100.0%	.0%	41
Campgrounds	11.3%	86.4%	2.4%	169
1999 UT State Park Telephone Survey	64.5%	31.2%	4.2%	333
2006 UT State Park Telephone Survey	65.0%	29.7%	5.3%	397

[a]Percentages of respondents with valid responses.

[b]Only respondents reporting perceived crowding were asked whether they supported use limits.

[c]Asked respondents specifically about use limits lower than the number of other visitors seen—survey question was unsuccessful, results flawed.

consistent. A caveat should also be issued regarding the results of this question on the *2004 GSENM* survey and the *2001 Utah River Study Mail Survey*. Only respondents who had reported crowding in the *2001 Utah River Study Mail Survey* were asked if they supported use limits. In the GSENM study, unlike other component studies, respondents were asked whether they thought the number of visitors "should be restricted to a *lower number than you saw today*?" (emphasis added). For one thing, this question is substantially different than the general use limit questions asked on other surveys, but more importantly, investigation of selected individual survey forms suggested the survey question was not entirely successful. Based on responses to the follow-up question asking why they did or did not support limits, some respondents seemed to be interpreting this as a question about use limits generally. For instance, at least one

respondent actually stated an appropriate number of other visitors to be allowed at the survey site at one time but had also recorded a substantially lower number of other people actually seen at the site. Others specifically said limits should be put in place but current use levels were acceptable. Therefore, the proportions of respondents addressing limits lower than current levels, as per the survey question, and those addressing use limits generally cannot be determined, making proper interpretation of these results impossible.

In addressing the hypothesis that the presence of conflict may be a substantial part of visitors' support for use rationing, results are somewhat mixed but in general the hypothesis seems to have been refuted in the context of the analysis of these open-ended responses. While conflict was mentioned in responses to this question in all survey data sets except the *2004 GSENM* study, it was generally far less frequent than perceived crowding. However, for the *2001 South Fork* boater intercept, conflict (with outfitters/guides as well as other non-guided visitors) was actually the dominant reason given at 40.3% of responses, ahead of perceived crowding that accounted for 26.2% of responses. The camper data set for this study also showed a relatively large proportion of responses citing conflict (21.1%), though the largest group (42.1%) referred to crowding. Other than this, conflict was a relatively minor stated reason for use limit support, not exceeding percentages in the teens as measured in either responses or respondents citing this, depending on the survey. Table 71 shows comparisons of predominant responses across studies.

While recreational conflict may not be as large a factor in visitor support for use limits as perceived crowding, it is nonetheless a factor and measures to mitigate conflict may alleviate some visitor/stakeholder perception of the need for use rationing. The

TABLE 71 Predominant Response Categories for Respondents' Support for Use Limits

	Why respondents support use limits				
Study	crowding	conflict	safety	resource impacts	n responses/ n respondents[a]
1999 UT State Park Intercept	40.4%	6.7%	36.0%	2.0%	1102/646
2001 UT State Park Intercept	43.6%	5.9%	39.1%	.9%	1000/540
2001 Mystic Lakes Boater Intercept	53.9%	16.9%	24.7%	1.1%	89/60
2001 Mystic Lakes Rec. Intercept	57.1%	7.1%	28.6%	7.1%	28/21
2001 S. Fork Snake Boater Intercept	26.2%	30.3%	1.3%	26.9%	298/217
2001 S. Fork Snake Camper Intercept	42.1%	21.1%		36.8%	19/14
2001 UT River Study Mail Survey	44.3%	13.2%		28.3%	
2004 GSENM Intercept	62.7%			19.6%	51[b]
2006 SASD Intercept					
Open dunes	32.1%	11.3%	54.7%		53/48
Campgrounds	52.2%	8.7%	21.7%		12/17
1999 UT State Park Teleph. Survey	38.6%	1.5%	46.8%	1.9%	267/205
2006 UT State Park Teleph. Survey	45.2%	7.9%	40.4%	.7%	292/258

[a]The first number indicates the number of responses while the second indicates the number of respondents from which these responses were taken.

[b] Unit of analysis was respondent.

Note. Because less common response categories are not presented, results do no add up to 100%.

prevalence of safety concerns as a reason for use limit support, however, does suggest that in many cases, mitigation of apparent safety issues may dramatically reduce the perceived need for use rationing. The relative prevalence of this response category reflects inherent differences in the recreation sites studied with many showing strong safety-related concerns and others showing no (or almost no) such issues. Those sites at which substantial safety concerns arose as a major theme are those supporting largely motorized recreation, be it watercraft on lakes/reservoirs or OHVs on sand dunes. Favorability to use limits itself, however, sets these motorized recreation sites in stark contrast, with spatially confined Utah reservoirs eliciting general support for use limits while respondents at the SASD show relatively strong opposition. Use limit opposition at the Mystic Lakes further shows the distinctness of this study area, as the lakes' status as a totally unique recreation resource in the region sets them apart from the otherwise similar Utah sate parks where use limits are generally supported.

The aforementioned problems with the GSENM survey question regarding use limits below respondents' observed use levels also hint at an underlying issue of some importance: whether respondent support for use limits is fueled by current perceptions of overcrowding or whether such support stems from fears about potential changes to the site in the future. Though responses to this survey question in other component studies were already coded to a degree, in cleaning the data sets, similar trends were observed with some respondents clearly expressing fears about potential changes to the site in the future rather than a need to address current problems. Due to the general brevity of answers it would be impossible to determine the exact degree to which respondents are reacting to current or future/hypothetical problems but it nevertheless seems to be something of potential interest in future research. The tentative conclusion that much use level support focuses on future crowding rather than current conditions coincides well with Cole et al.'s (1997) findings in which most Cascade Range wilderness visitors favored limits but only at use levels higher than those actually observed.

While neither the data nor this analysis of it specifically addressed this issue, both were suggestive of the complexity of perceived crowding as a concept. While it is often presented as a unified construct, it seems to be composed of several rather disparate perceived crowding concepts, as suggested by Altman (1975) and Gramann (1982). In the simplest form, the categorized reasons for use limit support from this thesis research suggest concepts such as crowding, safety concerns, use density exceeding facilities capacity (though this was only a small problem in these data sets), etc. On a deeper level more in line with the theoretical frameworks of Altman or Gramann, the category expressing "crowding" may be split into important subcategories with different survey

questions meant to specifically assess this. While it was difficult to investigate given the brevity of the survey questions and generally very brief responses, many seemed to assess different perceived crowding issues. Many responses referred to or hinted at the problem being restrictions on freedom of movement in reservoir/lake recreation areas. In a different vein, open-ended responses from GSENM and Utah rafting rivers sometimes used specific terms such as "solitude" and "wilderness" experiences, unlike responses from other surveys. It also seems reasonable to assume that many crowding responses from the fishing-oriented South Fork of the Snake River may have had more to do with the spatial requirements of angling and the interference with this inherent in higher densities. While all of these may be seen as different forms of goal interference or blocking, they are conceptually rather different goals. In the first case, the goal is to recreate without physical restrictions to one's watercraft, while the second case refers to the solitude experiences—the type of recreation from which much of the perceived crowding and social carrying capacity literature originated. Lastly, the consumptive motive in angling is potentially thwarted by the proximity of others. While actual analysis of these issues did not seem legitimately possible with this data, anecdotal evidence did seem to hint at these types of theoretical divisions within the crowding concept.

Multivariate Analyses

Multiple Regression Models for Perceived Crowding Dependent Variables

The nine multiple regression models constructed for perceived crowding dependent variables make it clear that many factors are correlated with crowding responses, though which factors are important seems to vary with recreational settings and activities. Table 72 summarizes the relationship of similar independent variables with the perceived crowding dependent variables across eight of these regression models.

TABLE 72 Statistically Significant Independent Variables for Multiple Regression Models with Perceived Crowding Dependent Variables

Study	Demographic Variables	Group Size	Visited before	Years /times visiting	Conflict	Water-body size	Est. use level	Parking lot Fullness	Fishing	REP: Solitude	Problems: Conflict	Problems: Crowded Location	Use Level Expectations
1999 UT St. Pk. Int.[b]	*-	*+			*+	*-	na	*+	na	na	na	na	na
2001 UT St. Pk. Int.[b]					*+	*-	na	*+	na	na	na	na	na
2001 S. Fk. Snake Boater			na	*+		na	*+	*+	na	na		*+	na
2001 UT River Int.[a]	*+			na	na	na	*+	na	na	na	na	na	na
2001 UT River Mail	*+		na		na	na		na		*+	*+	*+	na
2004 GSENM Int.	*-			*+	na	na	*+	*+	na	na	na	na	*+
2004 GSENM Mail	*-			*+	na	na	*+		na		na	na	*+
2006 SASD Int.						na	*+	na	na		na	na	

* Statistically significant ($P \leq .05$)

"+" denotes positive associations while, "–" denotes negative associations.

[a]Used perceived crowding relative to number of people seen as dependent variable not interactive crowding variable.

[b]Used a logistic regression model.

The OLS regression model built for the interactive perceived crowding dependent variable is omitted due to its lack of comparability with other perceived crowding regression models. This variable incorporated respondents' perceived crowding responses to both numbers of people and watercraft encountered, while other surveys, perceived crowding variables dealt only with the number of other people encountered (See Chapter 3: Methods, p. 62).

Overall, variations in use level are the most consistent factor affecting visitors' crowding perceptions. In all but one model, user estimates of encounters were statistically significant and positively correlated with perceived crowding. The exception was the mail-back portion of the *2001 Utah River Study* where use level estimates were obtained on-site and all other variables, including perceived crowding, were recorded later when respondents completed the survey mailed to them. Parking lot fullness variables were statistically significant when available with the exception of the *2004 GSENM Mail Survey* where parking lot fullness approached but did not reach statistical significance at the .05 level ($p = .073$). Standardized regression coefficients for these variables were relatively large compared to other model variables with a few notable exceptions discussed below. In absolute terms though, only the coefficients for the logistic regression models for the 1999 and 2001 *Utah State Park Intercept* surveys are strikingly large with respondents nearly 73% more likely to report crowding with a one point increase in the four-point parking lot fullness scale in1999 and nearly 98% more likely to report crowding with a one point increase in the three-point scale for 2001. Based on use level estimates, OLS regression models estimate respondents would need to encounter 1,000 other visitors to raise crowding perceptions by one point on the five-

point scale used in the *2001 Utah River Study* intercept and *2006 SASD* intercept surveys. The same effect would be produced by encounters with 200 other visitors in the 2001 *South Fork of the Snake River* boater intercept survey and by 167 in the *2004 GSENM* surveys (intercept and mail). With the exception of the two Utah state park intercept studies, these numbers seem quite modest and leave the impression that perceived crowding is a more complex phenomenon than a simple function of use density. It also highlights the divergence between reservoir/lake recreation, with its clearly defined boundaries, and other forms of outdoor recreation where visitors have far greater freedom of movement. It is interesting to note the model with the greatest explanatory power—the model for the *2001 Utah River Study* mail survey with an R^2 value of .359—included no statistically significant measures of use level.

The relative strength of the correlation between variations in use level and crowding perceptions can also be assessed by looking at changes in R^2 (and pseudo- R^2) values made by addition of use level variables, controlled for other model variables (Table 73). It must be cautioned that this comparison combines R^2s, pseudo-R^2s, and models with various independent variables and thus should be approached as only suggestive in nature and necessarily very rough.

With the exception of the exceedingly low R^2 and use level-related R^2 change values in the *SASD* regression model and *Utah River Study* mail survey, change attributed to use level measurements ranges from a statistical explanation of 5.3% to 7.7% of the variation in respondents' perceived crowding responses. The Utah state park intercept survey models, using pseudo-R^2s, produced values approximating 4.1% and 5.7% predictive abilities of the logistic regression model relative to whether or not respondents

TABLE 73 Changes in R^2 Value Attributed to Use Level Independent Variables

Study	Overall R^2	R^2 change attributed to use level variables
1999 UT State Park Intercept[b c]	.143	.041
2001 UT State Park Intercept[b c]	.132	.057
2001 S. Fk .Snake Boater Intercept[c d]	.184	.077
2001 UT River Study Intercept[a d e]	.059	.054
2001 UT River Study Mail Survey	.359	.001
2004 GSENM Intercept[c d]	.202	.053
2004 GSENM Mail Survey[c d]	.260	.057
2006 SASD Intercept[d]	.026	.012

[a]Used perceived crowding relative to number of people seen as dependent variable not interactive crowding variable.
[b]Logistic regression model reporting Nagelkerke pseudo-R^2.
[c]Survey used parking lot fullness as measure of use level.
[d]Survey recorded respondent estimates of number of people seen as a measure of use level.
[e]Survey recorded respondent estimates of number of watercraft seen as a measure of use level.

reported crowding. While side-by-side comparison of these two different measures is strictly considered invalid (University of California, Los Angeles, Academic Technology Service, n.d.), the overall impression left by Table 73 is the relatively small amount of variation in crowding perceptions that can be ascribed to use density variations based on these multiple regression models.

While the *SASD* OLS regression model for perceived crowding showed a non-statistically significant relationship with the variable contrasting respondents' use level expectations and on-site observations, in the *GSENM* surveys (both intercept and mail) this variable was by far the strongest explanatory variable in terms of standardized regression coefficient. This seems to validate the importance of the *expectancy* and *discrepancy* theories discussed by Schreyer and Roggenbuck (1978) in outdoor recreation, wherein recreationists choose recreation sites and areas based on experiential goals to be achieved. Divergence between experience and goals leads to dissatisfaction.

Due to the lack of association between dissatisfaction and use levels noted both in the literature and in this study, we may reframe the theory in this context as a divergence between expectation/goals and actual experience leading to perceived crowding. Logically, this seems to be contingent, as well, on the degree to which recreational goals and expectations incorporate low use levels, though this aspect of the reformulated theory is not discernable from the data. Suffice to say, exceeded use level expectations are correlated with perceived crowding, while lower than expected use levels may lead to perceived isolation. It seems rational from this to say recreationists choose recreational sites based on expectations of various factors that may include use densities.

Perhaps even more directly, the observed importance of use level expectations in these regression models fits well with Gramann's (1982) conceptualization of *stimulus overload*, where the violation of expectations regarding use levels leads to the perception of a loss of control in individuals who then experience crowding. This theoretical concept is distinguished from that of Schreyer and Roggenbuck by the centrality of personal control over recreational situations.

The lack of statistical significance for the *SASD* model may have to do with the uniqueness of this area amongst the component study areas since it is the only one used primarily for land-based motorized recreation. This is born out by the extreme infrequency of perceived crowding here relative to other component studies. Only 5.4% of respondents indicated there were "far" or "somewhat too many" other people on the open dunes—far fewer than the 16.2% who indicated "far" or "somewhat too few." This largely intuitive attribution of the unique aspects of responses in this study is far from

certain and the distinctions between motorized and non-motorized land-based recreation relative to solitude and perceived crowding concepts is deserving of further study.

Independent variables measuring the frequency of conflict with other visitors were statistically significant for the two Utah state park intercept surveys but not for the other two studies using this variable: the *South Fork* boaters and the *SASD* intercept surveys. In both state park studies, the magnitudes of these variables' coefficients was large relative to other variables. For the 1999 study, the exponent of the b value for the conflict frequency variable was comparable to that of the parking lot fullness variable (both were measured using four point scales). As mentioned previously, the bounded nature of these lakes and reservoirs may contribute to the frequency of recreational conflict, as may the prevalence of various different types of recreational activities here, such as wake boarding, waterskiing, various types of angling, PWC use, etc. It was surprising the variable was not statistically significant on the South Fork where the spatial requirements of river angling were hypothesized to be a contributor to crowding perceptions.

Several other variables specific to certain study areas were found to be statistically significant. First, both state park study logistic regression models for perceived crowding, not surprisingly, showed a statistically significant relationship with water body surface area. The independent variable measuring the degree to which respondents thought congestion at take-outs was a problem in the *Utah River Study* mail and *South Fork* boater intercept surveys was statistically significantly associated with perceived crowding. Again, this suggests some visitor crowding perceptions may be mitigated by dealing with these pinch points specifically. In addition, the OLS regression

model for the only study that collected information on respondents' educational level, the *Utah River Study Mail Survey*, showed a statistically significant relationship, with more highly educated respondents more frequently reporting higher crowding levels.

In the OLS regression model for perceived crowding in the *Utah River Study Mail Survey*, by far the strongest explanatory variable, in terms of standardized coefficient, was the degree to which respondents thought large groups were a problem. This may imply, at least in this context, the size of groups encountered may be a bigger trigger of perceived crowding than the number of other people or parties encountered. This finding, though, is suggestive of the venerable findings of Stankey (1973), where river runners preferred more encounters with small groups than even a very few encounters with large groups.

The number of years respondents had visited study areas showed mixed results, though when the variable was statistically significant, visitors with a longer relationship with the area were always more likely to report crowding. This was the case for South Fork boaters as well as respondents to both mail and intercept surveys regarding the GSENM. On the other hand, respondents' age, when statistically significant, was always negatively associated with perceived crowding. This was the case for both *GSENM* surveys and the *1999 Utah State Park Intercept Survey*.

The relationship between independent variables representing whether or not respondents fished, their sex, the size of the group with which they are recreating, and REP scale items representing solitude preferences were generally not supported by these multiple regression models. One of two REP scale items did show statistical significance in the regression model for the *Utah River Study Mail Survey* but this was not replicated

in the *GSENM Mail Survey* or the *SASD Intercept Survey*, where no scale items were statistically significant. The weakness of the REP scale items was particularly surprising and it is unclear whether this is representative of weaknesses in their employment and communication of their meaning to respondents or of weaknesses of the REP solitude concept as it relates to perceived crowding. It seems likely using these scale items as single variables in the regression analyses may not be their most appropriate use inasmuch as they were intended for use as groups of scale items in the assessment of various aspects of recreational motivations and their successful attainment (Manfredo & Driver, 1996).

Models for Support for Use Limits
Dependent Variables

Overall patterns and trends were somewhat more difficult to observe for this set of multiple regression models. Perhaps what is not statistically significant in most of these models is more telling than what is. In a similar manner to Table 72, for multiple regression models built for perceived crowding dependent variables, Table 74 summarizes the results from the five multiple regression models for support for use limits dependent variables and the relationships of similar independent variables with the dependent variables.

The most notable absence of statistical significance is for perceived crowding measures as independent variables, where only one model, that for South Fork boaters, produced a p value of .05 or lower. This overall result may imply support for use limits is more predicated on fears about potential future conditions than on visitor reactions to current conditions, as suggested by previously describe open-ended responses. It may

TABLE 74 Statistically Significant Independent Variables for Multiple Regression Models with Support for Use Limits Dependent Variables

Study	Demographic Variables	Group Size	With commercial guide/outfitter	Visited before	Years /times visiting	Conflict	Water-body size	Est. use level	Parking lot Fullness	Fishing	REP: Solitude	Problems: Conflict	Problems: Crowded Location	Use Level Expectations	Perceived Crowding
1999 UT State Park Intercept	*-	*+	na		*-	*+	*-	na		na	na	na	na	na	
2001 UT State Park Intercept			na			*+	*-	na		na	na	na	na	na	
2001 S. Fk. Snake Boater Intercept			*+		*-		na		*-		na	*+	*+	na	*+
2004 GSENM Intercept[a]			na			na	na		*+	na	na	na	na		
2006 SASD Intercept	*+		na	na			na		na	na		na	na	*+	

* Statistically significant ($p \leq .05$)
"+" denotes positive associations, while "–" denotes negative associations.
[a]Used a logistic regression model.

also be suggestive of the various reasons behind use limit support identified in univariate analyses of open ended responses. However, the fact crowding was generally the predominant reason for this support in open-ended responses tends to suggest support may be based on respondents' desires to keep conditions as they currently are.

Contributing to these tentative conclusions was the lack of any statistically significant association between respondents' estimates of use level and support for use limits. Likewise, parking lot fullness was in three cases not statistically significant in its relationship with use limit support, and had a statistically significant negative relationship for South Fork boaters. While a statistically significant relationship was present for *GSENM Intercept Survey* respondents, the lack of association with use level estimates suggests this may be a function of greater support for use limits at the few sites susceptible to higher levels of parking density (as described in Chapter 4: Results, p.

118). The puzzling negative relationship for South Fork boaters may be present due to a similar phenomenon.

As in the models for perceived crowding dependent variables, independent variables measuring the frequency of conflict in use limit support models were statistically significant only for the two Utah state park intercept surveys. This finding runs counter to the results from the univariate analysis of respondents stated reasons for use limit support, where only a small percentage attributed their support to recreational conflict. It is unclear what the reasons for this might be but it does suggest conflict is, at least to an extent, responsible for public support for use rationing.

It was surprising that these results regarding conflict, as well as those from the perceived crowding regression models, were a reversal of the trends observed in examination of respondents' open-ended reasons for supporting use limits. The South Fork, where conflict was a frequent reason for supporting use limits, did not show a statistically significant relationship between this and either dependent variable in either regression model. The state park data sets, where respondents seldom cited conflict as a reason use limits were desirable, showed statistically significant relationships between conflict and both dependent variables in multiple regression analyses. The clearest conclusion available from this paradox is the crowding/conflict interaction is complex and the assessment not entirely adequate using the available survey data.

As expected, water body surface area was a statistically significant explanatory variable for the two relevant regression models. Three independent variables included only in the *South Fork* boater intercept survey were statistically significant: (1) respondents fishing the river with a guide/outfitter were more often in favor of use limits,

and there was a positive association between support for limits and the degree to which respondents felt (2) conflicts between groups and (3) take-out area crowding were a problem.

Mixed results were found with regard to the number of years respondents had been visiting the survey area. Negative, statistically significant associations were produced in models for South Fork boaters and Utah state parks visitors in 1999 but other models showed no statistically significant relationship. The direction of the relationship is opposite that for the perceived crowding model for the *South Fork* boater intercept survey. It seems long term association with a site/area may lead to visitors who are reluctant to be prevented from accessing a site due to managerial limits, despite their potentially increased susceptibility to perceived crowding.

The variable measuring whether expectations about use level were met, exceeded, or fallen short of was statistically significant in the *SASD Intercept Survey* model, with exceeded expectations associated with increased use limit support. This association was not observed in the *GSENM Intercept Survey* model, however, despite the strength of this variable in providing a statistical explanation for perceived crowding with this data set.

Independent variables representing visitor demographics, respondent's group size, whether they had visited before, whether they were engaged in fishing, and REP scale items representing solitude preference did not show substantial association with support for use limits overall. As with the perceived crowding regression analyses, the lack of association with the REP solitude construct was somewhat surprising.

CHAPTER 6

SUMMARY AND CONCLUSIONS

In concluding this thesis, the broader management and research implications of the findings of this study are described. This is followed with discussion of the limitations inherent in this project, followed by recommendations about future research in this area of study.

Broader Implications

One major theme clearly evident from the various analyses comprising this thesis research is the uniqueness of each outdoor recreation site involved in the study. The level of complexity created by the varying characteristics of the study sites in addition to the various independent variables available for use in multiple regression models was daunting as far as overall interpretation and condensation of results into a useful set of recommendations. Nevertheless several trends do seem to clearly emerge.

For one thing, as a "necessary antecedent" (Schmidt & Keating, 1979, p. 681) to perceived crowding, use level estimates, or surrogates thereof, are consistently statistically significant explanatory variables for perceived crowding. However, the estimations of only between .1% and 7.7% of the variation in perceived crowding responses explained or predicted by use level brings into question the magnitude of the relationship. The vast majority of the variation in respondents' subjective responses to use densities remains unexplained and seems to be related to factors other than use level or which interact with use level. This brings into question the overall effectiveness of

recreational carrying capacities in managing social-experiential aspects of outdoor recreation sites inasmuch as such management frameworks seek to regulate only numbers of users permitted in a site at one time.

Going beyond this, the now ubiquitous observation in the reviewed literature, acknowledging there is no meaningful correlation between use level and satisfaction, raises doubts about the overall prevalence of perceived crowding studies and *normative* carrying capacity estimations. In this study, the unconvincing relationship seen in bivariate analyses of satisfaction and perceived crowding—the concept meant to bridge this gap—also serves to highlight the questionable position crowding and social carrying capacities hold within the outdoor recreation management field. All this is not to say there are not sites that should be managed for low use levels based on specific management objectives; the data simply do not seem to support the widespread prevalence of carrying capacities as a management framework appropriate for all, or even most recreation sites.

Indeed, the differences between site types notable in multivariate analyses for both dependent variables highlights the need for varying, adaptable management practices specific to the needs of each site, rather than a one-size-fits-all approach such as determining a numerical carrying capacity and implementing use limits. For instance, Utah state park reservoirs might apply measures to increase boating safety awareness, while extreme low-use areas expected to receive increased visitation might be put on a permit system to protect solitude experiences.

That safety emerged as such a pronounced concern in respondents' reasons for supporting use rationing at motorized use areas studied here—particularly the lakes and

reservoirs—is indicative of the potential usefulness of any measures aimed at mitigating perceived safety concerns and increasing visitor safety. It is interesting that the degree to which safety concerns are a factor in crowding/carrying capacity inquiry here parallel the degree to which safety concerns colored respondents' conflict perceptions in the study of hiker-horse packer-llama packer use conflict by Blahna, Smith, and Anderson (1995). Figure 1 in Chapter 3: Review of Literature of this thesis (p. 53) could accurately be amended to include safety as an additional box connected to box 5, *Support for and Implementation of Carrying Capacity/Use Rationing*.

Blahna and Reiter's (2001) findings from different analysis of the *2001 Utah River Study* component of the data used in this thesis research showed respondents at low-use areas were more vulnerable to crowding. At this type of site, a good case can be made for preserving these increasingly scarce solitude opportunities. While, Stewart and Cole (2001) did not find statistically significant differences in perceived crowding-use level relationships at high and low use sites in the Grand Canyon National Park backcountry, the concept seems vitally important based on Blahna and Reiter's results coupled with the conceptual basis set forth by Cole (2000) and McCool and Cole (2001) and the importance of user expectations observed in this thesis research (at least in the *2004 GSENM* surveys).

Results from this study are fully in line with articles advocating this type of regional management perspective where emphasis is placed upon providing a variety of recreational experiences across sites within a management region (Blahna & Reiter, 2001; Borrie et al., 1998; Cole, 2000; McCool & Cole, 2001; Schreyer, 1985). The overall prevalence of potential use dispersal through use limits is shown in this study

through the proportions of users reporting they would move elsewhere for the same activity if use limits excluded them from the survey site. While this tells us relatively little about the potential dispersal, it does roughly show its potential effects, especially when combined with the analyses of the 1999 and 2001 *Utah River Study Boater Intercept Survey* data completed by Reiter et al. (2001[b]; 2002[a]). These analyses revealed that most respondents reported they would go to the nearest similar lake or reservoir, which for the most part were sites operated by the same state agency. This is suggestive of the potential for use limits to relocate, rather than solve, crowding problems. It also suggests the potential for the type of "homogenization and suboptimization" of recreation sites described by McCool and Cole (2001, pp. 85-86), wherein opportunities, with regard to use levels, are made more similar across individual recreation sites as high-use sites are limited and low-use sites receive increasing visitation. In theory, at least, the opportunities presented by very high- and low-use sites could be eliminated and replaced by moderately high use levels across the sites in a region.

Recreationists' self-selection of recreation sites based on their various characteristics, as described by Shelby and Heberlein (1986), is bolstered by the importance of use level expectations shown here. Such individual choices about preferred sites for these experiences do not seem to be something that land managers can easily manage and ideas about widespread optimization of use levels at individual sites seem to be somewhat misguided in this regard. The ability of certain sites to accommodate very high use levels might more appropriately be looked at as a positive attribute and the continued use of such sites taken as an affirmation of their ability to provide sought after experiences even at these high use densities. Means other than

carrying capacities may be more useful in assuring high-use, front country sites can appropriately accommodate use levels. This might include ensuring sufficient parking, restrooms, and other amenities, as well as suggesting the use of site design characteristics meant to prevent conflicts and physical congestion. It is notable that strategies meant to concentrate, rather than disperse, recreational use have also been viewed as the most effective means of minimizing biophysical impacts in most situations (Cole, 1995[a], 1995[b]; Hammitt & Cole, 1998).

The small portion of variance which appears to be statistically explained by use levels in this research (.1% to 7.7%), as well as the similarly small percentage of users who were strongly affected by crowding in the research of Stewart and Cole (2001) (between 2% and 6%) suggests managing specifically for these users is not likely to be effective overall management strategy. As these visitors are presumably attracted to very low use levels, use rationing at relatively high-use sites seems unlikely to address these users' solitude- or privacy-related goals as use would have to be restricted to extremely low levels. Rather, given the apparent importance of expectations about use levels, visitor education regarding what types of use density to expect and where motivated visitors may find suitably low use seem a more effective means of managing for these types of visitors.

That recreationists are sensitive to potential changes in conditions in recreation sites is tentatively suggested by both multivariate and univariate analysis of reasons for respondents' support of use limits, as well as literature by Shelby and Heberlein (1986) and Manning (1999). However, rather than necessarily suggesting use should be restricted near current levels, this raises important social questions about for whom public

lands should be managed. Do the preferences of current users trump the desire for access by future visitors, especially given a growing population? Difficult as it is, this question is probably best answered by a reiteration of the importance of a diversity of sites and site characteristics as well as by the importance of clear management objectives. It seems that managing for current conditions would be appropriate only in situations where changing use characteristics violated management objectives for a site, or where objectives clearly specified a site be managed for the benefit of long-term users.

In addition to the largely spatial implications described above, some temporal complexity is suggested by the complete lack of statistical significance in use density estimations in statistically explaining the perceived crowding dependent variable in the *2001 Utah River Study* mail survey. This lack of association contrasts with the more substantial, statistically significant association shown in the regression model for the intercept portion of the *Utah River Study*. Thus, while on-site estimates of the number of encounters a respondent experiences appear to be correlated with on-site crowding perceptions, experiences are later reappraised to the degree where this correlation seems to disappear. While this supports the concept of *rationalization* described by Shelby and Heberlein (1986) in the context of the lack of correlation between satisfaction and use density, it does little to contradict previous conclusions about the modest relationship between use density and perceived crowding. More accurately, it implies the modest relationship between these variables becomes statistically non-existent when evaluated long enough after the actual experience.

Study Limitations

Throughout this thesis, an attempt has been made to be candid about the inherent limitations of this type of reanalysis of existing data. Clearly, not all surveys posed "ideal" questions relative to the specific questions posed in this thesis research, nor did they all contain all the questions that would be asked in a survey focusing on crowding and carrying capacity issues. While the questions on the individual component surveys were chosen based on the differing goals particular to each study rather than for the purposes of this thesis research, this fact is compensated for by availability of this amount of data and number of surveys, respondents, and recreation sites.

A few specific issues were noted as study weaknesses which should be singled out, however. Foremost among these is the issue of use level measurement. Essentially, measures of number of filled spaces in survey site parking lots proved a crude and somewhat problematic measurement device for a number of reasons. While this measure seems to have been somewhat successful in intercept surveys at Utah state park reservoirs and lakes, with clear connections between the recreation site and its parking facilities, the same cannot be said for the South Fork of the Snake River or sites on the GSENM. In the latter case, the size of parking areas relative to particular site characteristics are not likely to be constant. Thus, the measurements' meanings relative to use levels is not constant across survey sites. As mentioned previously, there is some reason to believe results may be more indicative of differences between sites prone to full parking areas and sites prone to be relatively empty more than they are indicative of the effects of varying use densities.

The overall coarseness of the parking lot fullness measurement is also somewhat problematic inasmuch as it does not take into account the number of people in each vehicle. Several large families may be constituted of more individuals than a larger number of childless couples or single individuals.

The fact that the measurements are made on only a four- or five-point scale and subject to survey technician error further highlights the limitations of parking lot fullness as a surrogate for use level. Nevertheless, the measure appears to have been at least roughly successful in the 1999 and 2001 *Utah State Park Boater Intercept Surveys*, where no other measure of use density was available, and thus, its presence in those regression models has, I hope, enhanced the utility of this research.

Some limitations were also observed in the scales used to measure perceived crowding. First, the infrequency (though, importantly, not absence) of respondents reporting "too few" other visitors made statistical analysis somewhat difficult in certain cases and may have limited the statistical explanatory power of some of the regression models to some extent (E. Helen Berry, personal correspondence, May 15, 2008).

Also, what is being assessed in respondents reporting "too few" other visitors is not totally clear. Hypothetically, this could include both individuals experiencing anxiety due to perceived isolation, or fears about receiving assistance in the case of an emergency, or it could be the result of respondents' surprise so few others were enjoying a recreation opportunity perceived to be of a very high quality. The distinction is perhaps important inasmuch as responses in the former cases indicate a negative reaction to a use density (much as responses of "too many" do) while in the latter case, the response indicates a neutral or positive reaction to the use density coupled with an evaluation of

how and where other people ought to spend there leisure time. Despite these caveats, there is no reason to favor other existing perceived crowding scales as they do not include the important dimension of isolation that would seem to be theoretically important to the study of human social interaction and use density in outdoor recreation.

A final note should be made about comparison across component studies. The inherent differences in regression models based on available variables, and how these variables were measured, as well as various differences in study areas, limit the scale of reasonable conclusions and generalizations. The side-by-side comparisons presented are intended to show large scale trends regarding crowding and opinions about carrying capacities/use limitations, rather than show precise quantitative details of these relationships. Taken as a whole, and combined with the body of previous research, I feel these comparisons are suggestive of the trends and conclusions detailed previously.

Recommendations for Future Research

A primary recommendation to come out of this thesis research has been touched on previously in this chapter and deals with the overall efficacy of crowding and social carrying capacity research. Based on this study, combined with large amounts of previous research and literature over several decades, there is little reason to believe this type of research and management procedure has a utility commensurate with its prevalence. This is especially true when one considers the often heated academic controversy provoked by crowding/carrying capacity research since at least the early 1980s with regard to its scientific validity, its effectiveness, and its social equity.

In this thesis research, the connection between perceived crowding and use density is only partial and leaves the great majority of variation in perceived crowding unexplained. On top of this the connections between perceived crowding and satisfaction remain tenuous at best. Essentially, there may be more useful subjects to study and more relevant aspects of outdoor recreation to intensively manage in providing the public with high quality opportunities across outdoor recreation sites as a whole.

Again, this is not to say there are not sites where perceived crowding may be a very legitimate problem. The issue is one of the almost ubiquitous prevalence of social carrying capacities in some circles of the outdoor recreation field such as the NPS mandate that all sites receive a carrying capacity (Manning, 2007).

If perceived crowding and carrying capacities are to remain a dominant focus in outdoor recreation management, perhaps studies might best be directed to areas that are still relatively poorly understood. The nature of solitude dependence and preference in outdoor recreation is one area that seems ripe for exploration. The seeming failure of REP scale items representing solitude preference both here and in Stewart and Cole (2001) is curious in light of the common acceptance of the concept that some recreationists actively seek, and have experiences dependent upon, achieved solitude. Where and for whom is solitude a priority? Such insights may help managers prioritize sites for protection of solitude as a social site attribute.

Also, Blahna and Reiter's (2001) finding of higher perceived crowding propensities at low-use sites deserves further empirical study. Ostensibly, this trend is due to a tendency by crowding-prone recreationists to choose of sites with generally low use levels. These recreationists would therefore be more sensitive to the presence of

others and therefore more likely to report perceived crowding. Even a relatively small number of encounters may interfere with their solitude achievement goals. Conversely, visitors choosing high-use sites seem unlikely to consider getting away from other people a prominent recreational goal and may be unlikely to have negative reactions to even a relatively large number of other visitors. Despite Blahna and Reiter's finding, this trend was not found by Stewart and Cole (2001), though the fact that they studied only "frontcountry" wilderness areas in Grand Canyon National Park may have led to an insufficient variety of use levels to distinguish this phenomenon. Regardless, the observations on this subject are intriguing and would benefit from further study, especially given the tendency for managers to focus on use rationing at sites supporting high use densities (Blahna & Reiter, 2001).

Grouping and cleaning open-ended data regarding why respondents supported use limits suggested the increased need to differentiate between perceived crowding based on solitude-related goal interference and crowding better characterized as physical crowding (Gramann, 1982). In the latter case, the goal interference involves the spatial needs of recreationists' specific activities. This type of crowding was inferred to be more common in the lake and reservoir locations used in this study, and at the SASD. In contrast, respondents used words such as "solitude" and "wilderness" in open-ended responses regarding use limit support from Utah rivers and the GSENM, implying a very different set of goals from the physical constraints responses seemed to be describing in use limit support responses at reservoirs and lakes. Future studies might be well served in attempting to differentiate types of perceived crowding in ways similar to those proposed

in Gramann's (1982) theoretical article where *physical* and *psychological* goal interference are separated conceptually.

These differences in crowding concepts seem to have been ignored by the *normative* studies that currently dominate this field. Given the small portion of perceived crowding actually statistically explained by use levels alone, according to this thesis research, future *normative* research might consider incorporating more potential crowding indicators into studies. Such indicators might include standards of behavior, the position and interplay of portions of sites susceptible to congestion, temporal aspects of high use densities, and the ability of respondents to easily access and use less crowded portions of a relatively high-use areas.

Important in so-called *normative* research, but equally valid to broader research areas, is the nature of use level expectations and the seeming need for better understanding of this concept. One remaining question is: what types of variation exist in visitor use level expectations for a given site? It is also unclear how much use level is considered acceptable beyond the expected level or at what point use reaches a level significantly enough above expectations to become noticeable or lead to perceived crowding. This is especially interesting in conjunction with study of the importance or lack of importance of solitude or density levels to different recreationists.

Related to use level expectations is another area for future research suggested by this study as well as the reviewed literature. Expectations suggest visitors choose preferred sites based on site characteristics discerned by previous visits. When use levels are deemed undesirable, especially as use levels may increase over time, what is the process of visitor displacement? Where do displaced visitors go and perhaps more

importantly, what are appropriate management approaches to visitor displacement? It is not clear that this type of recreationist self-management should necessarily be regarded negatively.

Finally, limitations inherent in use level measures used in this study suggest future research could benefit from using both subjective visitor reports of estimated numbers of encounters as well as more accurate direct measures of use levels at a site. Ideally, this would consist of a technician measured count of the number of people (or perhaps water craft of groups depending on study goals) in the study area.

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APPENDICES

Appendix A

Component Survey Methods and Sampling Procedures

The following descriptions of survey methods were taken from the technical reports for each survey used. The names of report authors are given in the citation of the technical report. Page numbers in the excepted text refer to the technical reports from which the text is taken. References to Appendices refer to those from the technical report except for those within brackets.

1999 Utah State Park Boater Intercept Survey

From Reiter, Blahna, Tolman and Bahr (2000)

> The survey research was conducted with a random sampling method. A roving interviewer administered the boater intercept survey at seven different boat launches at the four study parks: Deer Creek (2 launches), Jordanelle (2 launches), Willard (2 launches), and East Canyon (1 launch). The sampling period was June 28 to August 27, 1999 for a total of 9 sampling weeks and 48 sampling days. Each park was surveyed a total of 12 six-hour days using a rotating time schedule: a morning to afternoon (9 a.m. to 3 p.m.) for half of the days and afternoon to evening (2 p.m. to 8 p.m.) for the remaining half. For August, the afternoon to evening sampling period moved back one hour (1 p.m. to 7 p.m.) to accommodate the change in daylight boating hours. These time periods were evenly split between the launches at each reservoir during the six-hour day, with the exception of East Canyon which has only one launch [see technical report for survey schedule].
>
> The survey was conducted in an interview questionnaire format. Any person operating a boat or personal watercraft and using the parks' launch facilities was asked to participate in the survey. Boaters were interviewed after they finished using the launch during take-out. After loading their boats on the trailers, the majority of the boaters would drive to the top of the ramp or into a nearby parking lot. As the boaters were finishing tying down their craft and stowing gear, they were approached by the interviewer who asked if they would participate in this study. By talking to the boaters in a staging area, the interviews were conducted without interfering with the ramp traffic flows. On less crowded days, all users taking out on the ramp were approached whereas on more crowded days, all users could not be contacted. One person on the boat was selected for the interview which was typically the boat's primary operator. If the boat drove away before they could be approached, the researcher indicated that the survey was refused and noted that the boater "drove away." If a survey was successfully completed, the researcher indicated that the survey was completed. In some cases

boaters refused to complete the survey after partially answering some of the [questions]. In these cases, the survey was noted as a "partial completion" in the general information box.

There were approximately 35 questions with a section on general use and user information (date, time of day, location, parking lot capacity, watercraft type, and gender). This general information section was completed by the interviewer with the exception of the respondent's age (pp. 6-7).

Interview results. A total of 1090 boaters were contacted through the survey. Each of the four reservoirs contributed nearly one-fourth of the total number of boaters contacted. Deer Creek accounted for 24.6%, Jordanelle for 26.0%, Willard Bay for 25.6%, and East Canyon for 23.7% of the total number surveyed [see Table 75]. Of the 1090 boaters contacted, 993 (91.1%) completed the survey, while 8 (0.7%) partially completed it, and 89 (8.2%) refused to be interviewed. The Jordanelle PWC ramp and East Canyon had the highest proportion of people refusing to be surveyed (13.5% and 12.4% respectively). These response rates indicate a representative sample of boaters were interviewed at all four reservoirs (p. 8).

2001 Utah State Park Boater Intercept Survey

From Reiter, Blahna, Redmond, and Bahr (2002[a])

The survey research was conducted with a random sampling method. A roving interviewer administered the boater intercept survey at seven different launches at the four reservoirs: Hyrum (1 launch); Bear Lake (3 launches, the two on the east shore are combined in the following discussion and labeled "Eastside"); Pineview (2 launches);

TABLE 75 1999 Utah State Park Boater Intercept: Sampling Results

Reservoir	Number of contacts		Response rate	
ramp	number (n)	percentage	number (n)	percentage
Deer Creek	*269*	*24.6%*	*254*	*94.4%*
island	103	9.4%	98	95.1%
main	166	15.2%	156	94.0%
Jordanelle	*283*	*26.0%*	*264*	*93.3%*
main	209	19.2%	200	95.7%
PWC	74	6.8%	64	86.5%
Willard Bay	*280*	*25.6%*	*257*	*91.8%*
north	140	12.8%	127	90.7%
south	140	12.8%	130	92.9%
East Canyon	*258*	*24.7%*	*226*	*87.6%*
Total	1090	100.0%	1001	91.8%

Note. Table reformatted from Table III.1 in Reiter et al. (2000).

and Echo (1 launch). The sampling period was May 28 to August 21, 2001 for a total of 14 weeks and 57 sampling days. Each reservoir was surveyed a total of 14 six-hour days (with the exception of Bear Lake with 15 sampling days) using a rotating time schedule: a morning to afternoon shift (9 a.m. to 3 p.m.) for half the days and an afternoon to evening shift (2 p.m. to 8 p.m.) for the remaining half. For August, the afternoon to evening sampling period moved back one hour (1 p.m. to 7 p.m.) to accommodate the change in daylight boating hours. These time periods were evenly split between the launches at each reservoir during the six-hour day, with the exception of Hyrum and Echo which only have one launch ramp each.

The survey was conducted in an interview questionnaire format. Any person operating a boat or PWC and using the designated launch facilities was asked to participate in the survey. Only one person per boating group was interviewed. Boaters were interviewed after they finished using the ramp during take-out. After loading their boats on the trailers, the majority of boaters would drive to the top of the ramp or into a nearby parking lot. As the boaters were finishing tying down their craft and stowing gear, they were approached by the interviewer who asked if they would participate in this study. By talking to the boaters in a staging area, the interviews were conducted without interfering with the ramp traffic flows. One person on the boat was selected for the interview which was typically the boat's primary operator. On most days, all users taking out at the ramps were approached whereas on the very crowded days, all users could not be personally contacted. If the boater drove away before they could be approached or if the interviewer was in the process of interviewing one boater while others drove off, the researcher indicated on the survey form the number of missed interviewing opportunities. In some cases boaters refused to participate and that was logged as a "refusal" on the survey form. In other cases, boaters terminated the interview part way through the survey. In these cases, the survey was noted as a "partial completion" in the general information box on the survey form.

There were approximately 35 questions with a section on general use and user information (date, time of day, location, parking lot capacity, watercraft type, gender, and age). This general information section was completed by the interviewer with the exception of the respondent's age (pp. 7-9).

Interview results. A total of 927 boaters were contacted through the survey with only 15 of those refusing to participate. The response rate was greater than 97% at each location [Table 76]. Of the total number of completed surveys (912), Pineview accounted for the highest percentage (34.9%) followed by Hyrum (22.3%), Bear Lake (22.1%), and Echo (20.7%). While the response rate after accounting for "missed" respondents remains high (ranging from 61.7% at Bear Lake Marina to 93.9% at Bear Lake Eastside), it must be noted that results will slightly [under-represent] visitors at crowded times.

[Table 77] summarizes the sampling results categorized by week day periods. The researcher was interviewing at Echo on Memorial Day (May 28) and

TABLE 76 2001 Utah State Park Boater Intercept: Survey Sampling Results

			Pineview		Bear Lake	
	Hyrum	Echo	port	bluff	marina	eastside
Contacts[a]	208	191	181	143	173	31
Refusals	5	2	5	1	2	0
Completed surveys	203	189	176	142	171	31
Response rate	97.6%	99.0%	97.2%	99.3%	98.8%	100.0%
Repeats	22	6	8	4	4	2
Misses[b]	34	94	78	42	107	2
Response rate without misses	85.9%	67.0%	69.9%%	77.3%	61.7%	93.9%

[a]Number of contacts presented does not include those previously interviewed (Repeats).
[b]Number of potential sample subjects missed to busy ramp use.
Note. Table reformatted from Table III.1 in Reiter et al. (2002[a]).

TABLE 77 2001 Utah State Park Boater Intercept: Weekday Period Sampling Summary[b]

			Pineview		Bear Lake		
Time of survey*	Hyrum	Echo	port	bluff	marina	eastside	All lakes
Days in sampling period							
weekdays	7.0	7.0	4.0	4.0	4.0	4.0	30.0
weekends/holidays	7.0	7.0	3.0	3.0	3.5	3.5	27.0
total	14.0	14.0	7.0	7.0	7.5	7.5	57.0
Complete surveys							
weekdays	24.6%	23.8%	46.0%	39.4%	44.4%	32.3%	27.0%
	(50)	(45)	(81)	(56)	(76)	(10)	(246)
weekends/holidays	75.4%	76.2%	54.0%	60.6%	55.6%	67.7%	73.0%%
	(153)	(144)	(95)	(86)	(95)	(21)	(666)
total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	(203)	(189)	(176)	(142)	(171)	(31)	(912)
Misses							
weekdays	36.4%	20.2%	25.6%	16.7%	8.8%	.0%	19.1%
	(12)	(18)	(20)	(7)	(9)	(0)	(66)
weekends/holidays	63.6%	79.8%	74.4%	83.3%	91.2%	100.0%	80.9%
	(21)	(71)	(58)	(35)	(93)	(2)	(280)
total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	00.0%
	(33)	(89)	(78)	(42)	(102)	(2)	(346)

[a]Weekdays include Monday, Tuesday, Wednesday, and Thursday; weekends/holidays include Friday, Saturday, and Sunday, with the addition of Monday the 28th of May and Tuesday the 24th of July.
[b]Responses (*n*) are shown in parentheses under the percentage.
Note. Table reformatted from Table III.2 in Reiter et al. (2002[a]).

at Hyrum on Pioneer Day (July 24). When comparing complete survey results for all locations, the number of weekend/holiday visitation was greater than during the workweek particularly at Hyrum and Echo. This is also evident when examining the ratio of misses on weekdays versus weekends/holidays (i.e., at certain times, the take-out traffic on weekends was so heavy that more boaters were taking out while the interviewer was completing an interview; thus, there were a greater proportion of missed interviews than when the traffic was lighter on the workweek days) [Table 75] (pp. 10-12).

2001 Mystic Lakes Recreation Visitors Survey

From Reiter, Blahna, and Spleiss (2002[b])

The field survey research was conducted with a random sampling method. A roving interviewer administered the intercept survey at four launches and other recreation sites (e.g., campgrounds, beaches, etc.) at the two reservoirs. There were two boat ramps at Sheridan (north and south) and two at Pactola (north and south). The sampling period was June 27 to September 10 [2001] for a total of 12 weeks and 56 sampling days. Each reservoir was surveyed a total of 28 six-hour days, half of those days surveying boaters and the other half non-boaters. The interviewer used a rotating time schedule with a morning to afternoon shift (9 a.m. to 3 p.m.) half the days and an afternoon to evening shift (2 p.m. to 8 p.m.) for the other half. For August and September, the afternoon to evening sampling period moved backward one hour (1 p.m. to 7 p.m.) to accommodate the change in daylight recreation hours. On the boater sampling days, these time periods were evenly split between the launches at each reservoir during the six-hour day. The intercept survey was conducted in an interview questionnaire format. We also mailed a survey form to each slip holder and asked them to think about their most current boating experience and fill out the survey.

Boater sampling. The boater survey was conducted in an interview questionnaire format. Any adult operating a boat and using the designated launch facilities was asked to participate in the survey. Only one person per boating group was interviewed. Boaters were interviewed after they finished using the ramp during take-out. After loading their boats on the trailers, the majority of boaters would drive to the top of the ramp or into a nearby parking lot. As the boaters were finishing tying down their craft and stowing gear, they were approached by the interviewer who asked if they would participate in this study. By talking to boaters in a staging area, the interviews were conducted without interfering with the ramp traffic flows. One person on the boat was selected for the interview which was typically the boat's primary operator. On most days, all users taking out at the ramps were approached whereas on very crowded days, all users could not be personally contacted. If the boater drove away before they could be approached or if the interviewer was in the process of interviewing one boater while others drove off, the researcher indicated on the survey form the number of missed interviewing opportunities. In some cases boaters refused to participate and that was logged as a "refusal" on the survey form. In other cases, boaters terminated the interview part way through the survey. In these cases, the survey was noted as a "partial completion" in the general information box on the survey form.

Non-boater sampling. As in the sampling of boaters, the non-boater survey was conducted in an interview format. However, one of the main differences between interviewing the two user groups was the method of making

initial contact. In the case of the boaters, the researcher stayed at the ramp during the sampling period and waited for boaters to come off the lake. For non-boaters, the researcher drove to different sites around the lakes and interviewed adults recreating at those sites. For instance, the researcher would begin the sampling day by stopping at a swimming beach, approach the recreationists using the site, and ask one adult in the group if they would be willing to be interviewed. The researcher noted on the survey where the interview was conducted and what activity the interviewee was engaged in at the time of the interviewer. After contacting each group at the beach site, the interviewer would drive to another site on that lake, for instance, the campground. There, the researcher would drive through the loops, stop at occupied sites where people were present, and approach campers and conduct interviews with a spokesperson for the groups. As in the sampling of boaters, the researcher noted missed opportunities, refusals, and partial survey completions.

Slip holder sampling. During the research design process, it was determined that it would be beneficial to obtain data from a third user group, people who store their boats in slips on the lakes. Because slip holders rarely need to use the take-out ramps and they are unlikely to be at their slips for an interview, a mail survey was sent to their homes. The Forest Service provided a list of names and addresses of all slip holders to the USU researchers. The available number of slips leased at each lake is limited and somewhat small (42 at Sheridan, 103 on the south side of Pactola, and 96 on the north side of Pactola). To obtain a sample large enough to make inferences about the population of slip holders, a survey was sent to each person on the list. This type of sampling differs from the method employed with the boaters and non-boaters in that those two groups were randomly systematically selected (probability systematic sample). Thus, the sample frame used to obtain data about the slip holders can be thought of as a non-probability census sample type. The same survey questions asked of the boaters were sent to the slip holders along with a cover letter. The cover letter explained the nature of the study and asked the recipient to think about their most recent excursion on the lake and answer the questions. A three tier mailing process was employed where: 1) the initial mailing consisted of a survey form, cover letter, and self-addressed stamped return envelope; 2) a reminder postcard was sent to all recipients ten days after the initial mailing; and 3) a second survey form, cover letter, and return envelope was sent to those who had not sent back a survey form ten days after the reminder postcard was mailed.

Survey instruments. The survey form contained about 50 questions on three pages with a section on general use and user information (date, time of day, location, parking lot capacity, watercraft type or activity, gender, and age). In the case of on-site interviews, this general information section was completed by the interviewer. The slip holders personally filled out this section (pp. 9-11).

Interview and mail survey response. A total of 134 boaters were contacted with only 9 of those refusing to participate. The response rate was greater than 92% at each lake [Table 78]. Of the total number of completed boater surveys, Sheridan accounted for 41.6% and Pactola for 58.4%. A total of 233 non-

boaters were contact with 7 refusing to be interviewed for a response rate of about 98% at Sheridan and 96% at Pactola. While interviewing boaters at Sheridan, 16 boats left before the researcher had the opportunity to interview them ["misses" in Table 79] and at Pactola, there were 22 misses. While the response rate after accounting for missed interview opportunities remains somewhat high (72.2% at Sheridan and 73.0% at Pactola), it must be noted that results will slightly under represent visitors at crowded times.

All 241 slip holders were mailed a copy of the survey, asked to think about their last boat trip on the lake where the slip is located, and fill out and return the questionnaire. Of the 42 Sheridan slip holders, 28 returned the survey for a response rate of 66.7%. For the Pactola slip holders (n = 199), 150 completed and returned the survey for a response rate of about 75% [Table 78].

[Table 79] summarizes the sampling results by week day periods. As mentioned in the previous chapter, the researcher conducted interviews for 56 days during the sampling period. Twenty eight days were spent at each lake, including14 days conducting boater interviews and 14 conducting non-boater interviews. Each subgroup (e.g., Sheridan boater, Pactola non-boater, etc.) was targeted for interviews two week days during the summer (i.e., 2 Sundays, 2 Mondays, etc.). On the Fourth of July (a Wednesday) surveys were taken of the Pactola non-boaters and on Labor Day (Monday, September 3), the researcher interviewed Sheridan boaters. Using the categories described in [Table 79], the sampling days were: Sheridan boaters, 7 weekdays and 7 weekends/holidays; Sheridan non-boaters, 8 weekdays and 6 weekends/holidays; Pactola boaters, 8 weekdays and 6 weekends/holidays; and Pactola non-boaters, 7 weekdays and 7 weekends/holidays. Slip holders were asked to fill out the day of the week that their most recent boat outing occurred.

When comparing completed survey results for all locations [Table 79], the weekend/holiday visitation amount was greater than during the workweek. However, there are some striking contrasts. The number of Sheridan (non-slip

TABLE 78 2001 Mystic Lakes Recreation Visitors Survey: Survey Sampling Results

	Sheridan			Pactola		
	boaters	non-boaters	slip holders	boaters	non-boaters	slip holders
Contacts[a]	56	112	42	78	121	199
Refusals/non-response[b]	4	2	14	5	5	49
Completed surveys	52	110	28	73	116	150
Response rate	92.9%	98.2%	66.7%	93.6%	95.9%	75.4%
Misses	16	0	na†	22	0	na[c]
Response rate without misses or refusals	72.2%	98.2%	na†	73.0%	95.9%	na[c]

[a]Slip holder contacts are the number of names on the original mailing list.
[b]Non-responses refer to slip holders that did not fill out and return the mail survey.
[c]All slip holders were mailed a survey.
Note. Table reformatted from Table III.1 in Reiter et al. (2002[b]).

TABLE 79 2001 Mystic Lakes Recreation Visitors Survey: Distribution of Survey Reponses by Type of Day[a]

	Sheridan			Pactola		
Time of use[b]	boaters	non-boaters	slip holders	boaters	non-boaters	slip holders
Weekdays	17.3%	45.5%	38.5%	41.1%	36.2%	48.5%
	(9)	(50)	(10)	(30)	(42)	(63)
Weekends/holidays	82.7%	54.5%	61.5%	58.9%	63.8%	51.5%
	(43)	(60)	(16)	(43)	(74)	(67)

[a]Responses (*n*) are shown in parentheses under the percentage.

[b]Weekdays include Monday, Tuesday, Wednesday, and Thursday; weekends/holidays include Friday, Saturday, and Sunday with the addition of Wednesday the 4th of July and Monday the 3rd of September, Labor Day.

Note. Table reformatted from Table III.2 in Reiter et al. (2002[b]).

holder) boaters was nearly five times higher on weekends/holidays while the number of Sheridan non-boaters was only slightly higher on weekends/holidays (54.5%) than weekdays (45.5%). At Pactola, nearly 60% of the boaters and 64% of the non-boaters were surveyed during the weekends. Another interesting comparison can be made between the slip holders. The Sheridan slip holders were more likely to be on the lake on weekends/holidays (61.5%) than the Pactola slip holders (51.5%). When further examining the days that the interviewer missed interviewing boaters because the ramp take-out traffic was heavy, there does not seem to be any differences between weekend and workweek days (pp. 12-14).

2001 South Fork of the Snake River Boater and Camper Visitor Survey

From Reiter, Blahna, and Zimmerman (2002[c])

Sampling design. The field survey research was conducted with a systematic random sampling method. Two roving researchers administered the intercept survey at five takeouts on the South Fork: 1) Byington; 2) Conant; 3) Spring Creek); 4) Wolf Flat; and 5) Fullmer. The sampling period was June 15 to September 9, 2001during which there were 46 sampling days for each technician. Each technician worked independently and collected surveys at the different locations for a total of 92 sample days. The technicians surveyed boaters and campers on a six hour shift per day and used a rotating time schedule with a morning to afternoon shift (10 am to 4 pm) half the days and an afternoon to evening shift (2 pm to 8 pm) for the other half. For August and September, the afternoon to evening sampling period moved backward one hour (1 pm to 7 pm) to accommodate the change in daylight. On the days the [technicians] were assigned to sample at the undeveloped takeouts on the north side of the river, the

time period was evenly split between the Wolf Flat and Fullmer takeouts during the six-hour day. Those two takeouts were analyzed as a single location [that] is referred to as the "North Side" in the report. Sampling dates were:

- June 15-18, 21-24, 27-30;
- July 1, 3-12, 15-18, 21-24, 27-30
- August 1-11, 20-24, 26-30
- September 1-5, 7-9.

The intercept surveys were self administered. In order to avoid possible selection bias, all adult boaters (about 16 years or older) coming off the river were asked to fill out a survey. Boaters were approached as they were coming off the river and tying off their boats. The research technicians identified themselves as a student at Utah State University and asked the contacts if they would take ten minutes to fill out a survey. Some respondents filled out the survey immediately after coming off the river while others would wait until the boats were loaded on the trailers and the gear stowed. This flexibility ensured the surveys were conducted without interfering with the ramp traffic flows. On most days, all boaters taking out at the ramps were approached whereas on very crowded days, all boaters could not be personally contacted. If the party drove away before they could be approached, the researcher made note of the number of missed survey opportunities. On this research project, the technicians noted that none of the parties coming off the river drove away before the technician had an opportunity to contact them. In some cases, boaters refused to participate and that was noted as a "refusal" in their daily logs. In other cases, the respondent indicated that they had completed a survey previously and was noted as a "repeat" in their logs. For a summary of the sampling results, see the next section.

Besides sampling boaters, the research was designed to also obtain information about those camping at designated campsites on the river accessible by boats. Most of those sites are located on the stretch between Conant and Byington takeouts. If the party had camped on the river, every other member of the party was asked to fill out the version of the questionnaire that contained questions about the camping experience. The other members of the party were asked to fill out the regular survey. Thus, we were able to obtain data regarding the camper sub-sample.

Questionnaires. There were two survey versions: one for boaters and one for campers (Appendix A). The instruments contained about 85 questions on four pages. The field technician was responsible for filling out the section on general information which included date, day of the week, time, takeout location, gender, age, and how crowded the parking lot appeared. The rest of the questions assessed the user's characteristics and attitudes toward South Fork river management, other visitors, and regulations. The questions were developed to assess the following: 1) demographic and visitor characteristics, 2) river and campsite use, 3) perception of river recreation satisfaction, conflicts, crowding, and displacement, 4) problems encountered on the river trip and attitudes toward development along the river, 5) attitudes about management rules and policy, and 6) open-ended comments and recommendations. The open-ended questions gave respondents the

opportunity to address personal ideas and concerns about river management along the South Fork.

Of the 1,214 respondents who filled out the surveys, 101 (8.3%) were campers. When adjusting for the sampling process, referred to above, where every other member of an overnight camping party was asked to fill out the camper survey version, it would appear that 202 (16.6%) of the 1,214 respondents camped while on the river and 1,012 (83.4%) did not spend overnight on the river. However, because of an uncertain variance in the actual ratio of boaters to campers surveyed (it was left to the field technicians to make the judgement whether or not to administer the camper survey based on visual clues, such as obvious presence of camping equipment stowed in the boat), results comparing boaters and campers [are] not weighted or adjusted.

In the following sections, descriptive statistics are presented for all survey questions. The summary tables present results from both boaters and campers and the tables containing boater response data are organized into the four takeout locations: Byington, Conant, Spring Creek, and North Side (pp. 9-11).

Intercept survey response. A total of 2,033 visitors were contacted (1,882 boaters and 151 campers) with 442 (417 boaters and 25 campers) indicating that they had previously filled out a survey form. Of the non-repeat contacts (1,591), 1214 completed a survey for an overall response rate of 76.3% with 352 of the 1465 boaters (24.0%) and 25 of the 126 campers (19.8%) refusing to fill out a survey [Table 80]. More than a third of the respondents who completed a survey were encountered at a later time during the sampling season ("repeats"). Only 101 (8.3%) completed a camper survey. However, when adjusting for the camper sampling strategy of having every other camper fill out a camper survey and the

TABLE 80 2001 South Fork of the Snake River Boaters and Campers Visitor Survey: Sampling Summary and Response Rate

	n (%)
Contacts[a]	2033
Repeats	442 (36.4%)
Non-repeat contacts	1591
Refusals	377
Completed surveys	1214
Response rate	76.3%
Boater survey	1113 (91.7%)
Camper survey	101 (8.3%)

[a]Includes comlpeted surveys, those who previously completed a survey (repeats), and refusals.

Note. Table reformatted from Table III.1 in Reiter et al. (2002[c]).

other half fill out a boater survey, about 16.6% of the respondents were probably camping at one of the river campsites.

[Tables 81 and 82 summarize] the sampling results by weekday periods. As mentioned in the previous chapter, the field technicians logged in a total of 92 six hour sampling days during the sampling period. Each technician sampled for 46 days. Twenty-three of those sampling days were at Byington and Conant, 25 at Spring Creek, and 21 at the undeveloped takeouts on the north bank (Wolf Flat and Fullmer, referred to as the North Side). On the Fourth of July (a Wednesday), one of the field technicians was located at Spring Creek while the other was at Conant. On Labor Day (Monday September 3), only one technician was in the field at Byington. Using the categories described in [Tables 81 and 82], the sampling locations were: Byington, 11 weekdays and 12 weekends/holiday; Conant, 11 weekdays and 12 weekends/holiday; Spring Creek, 13 weekdays and 12 weekends/holidays; and North Side, 11 weekdays and 10 weekends. Thus sampling was relatively evenly distributed but compared to the other sites, there were two extra days at Spring Creek and two fewer weekend days at the North Side takeouts.

TABLE 81 2001 South Fork of the Snake River Boaters and Campers Visitor Survey: Boater Sample Size by Day and Take-out Location

	Byington	Conant	Spring Creek	Wolf Flat	Fullmer	Total
Weekdays[a]	51.3%	41.6%	46.9%	38.1%	51.6%	46.7%
	(173)	(132)	(191)	(8)	(16)	(520)
Weekends[b]	48.7%	58.4%	53.1%	61.9%	48.4%	53.3%
	(164)	(185)	(216)	(13)	(15)	(593)

[a]Weekdays include Monday, Tuesday, Wednesday, and Thursday with the exception of Wednesday the 4th of July and Monday the 3rd of September, Labor Day.

[b]Weekends include Friday, Saturday, and Sunday with the addition of Wednesday the 4th of July and Monday the 3rd of September, Labor Day.

Note. Table reformatted from Table III.2 in Reiter et al. (2002[c]).

TABLE 82 2001 South Fork of the Snake River Boaters and Campers Visitor Survey: Camper Sample Size by Day and Take-out Location

	Byington	Conant	Spring Creek	Wolf Flat	Fullmer	Total
Weekdays[a]	23.7%	.0%	100.0%	.0%	.0%	23.8%
	(23)	(0)	(1)	(0)	(0)	(24)
Weekends[b]	76.3%	.0%	.0%	100.0%	100.0%	76.2%
	(74)	(0)	(0)	(1)	(2)	(77)

[a]Weekdays include Monday, Tuesday, Wednesday, and Thursday with the exception of Wednesday the 4th of July and Monday the 3rd of September, Labor Day.

[b]Weekends include Friday, Saturday, and Sunday with the addition of Wednesday the 4th of July and Monday the 3rd of September, Labor Day.

Note. Table reformatted from Table III.3 in Reiter et al. (2002[c]).

When comparing the completed boater survey results for all locations [Table 81], the weekend/holiday visitation amount is only slightly larger than during the workweek. At Byington and Fullmer, the technicians encountered a slightly greater number of boaters during the weekdays. These findings contrast with the campers. More than three times (77) the number of campers take out on the weekends/holidays than during the work week [Table 82]. It should be noted that 97 of the 101 campers surveyed (96.0%) were contacted at Byington. Therefore, subsequent tables showing results from the camper survey will not be categorized by the different takeout locations (pp.12-14).

2001 Utah River Study

From Reiter, Blahna, and Evans (2001[a]) and Reiter and Blahna (2001)

The research study consisted of gathering data during two survey phases[:] a point of contact intercept survey and a subsequent mail-back survey. For the intercept survey, research technicians were divided into three teams of two. Between May and September, 1999, they rotated among the nine river segments, contacting river runners at the take-outs and asking them to fill out a short, two-page survey. The intercept survey contained key questions that were most dependent on recall such as the number of boaters and watercraft they saw during their trip, and crowding and conflict questions [see Reiter et al., 2001[a], Appendix III-1]. The questionnaire also included a space for their name and address if they were willing to complete a more comprehensive mail-back questionnaire (Reiter et al., 2001[a], p. II.5).

The questionnaires were distributed to a sample of river runners by field technicians at ten takeouts on nine river segments: San Juan River Upper and Lower segments; Westwater Canyon and the Daily section of the Colorado River; Labyrinth, Desolation, Brown's Park, and the Daily section of the Green River; and the Utah portion of the White River. The sampling days designated were based on a systematic sampling scheme with three teams of two field technicians each rotating among the different segments [see Reiter et al., 2001[a] Appendix II-1]. This scheme attempted to take into account atypical conditions between the different segments such as the interval and duration of river flows favorable to river running. The sampling period was between May 10 and September 30 in 1999. In order to avoid possible selection bias, all adult boaters (15 years and older) coming off the river were asked to fill out a survey.

An attempt was made to evenly sample all takeouts by the days of the week (weekend days vs. weekdays) and time of day (11:00 am to 2:00 pm, 2:00 pm to 5:00 pm, and 5:00 pm to 8:00 pm). Two of those three hour sampling blocks comprise one sampling day. As indicated on [Table 83], at Desolation,

research technicians were sampling during 14 weekend days and 24 weekdays. The sampling days were similar at Westwater with 12 weekend days and 27 weekdays. Due to weather, dam releases, low water flows, below normal snowpack, etc., it was difficult to obtain a rigorous ratio sampling of the segments.

Of the 2360 river runners contacted, 2248 completed the intercept survey for a 95% overall response rate [Table 83]. The number of respondents varied greatly among the different segments with 47 at the White River and 638 at the Colorado Daily. It should be noted that the White River water flow was extremely low during the 1999 season and was floatable for only about three weeks. [Table 81] summarizes the week day periods that sampling took place, the number of respondents, and the response rate for each segment (Reiter et al., 2001[a], pp. II.5-II.6).

The survey mailing design involved three mailings: 1) sending a cover letter and the survey instrument; 2) sending a reminder postcard 10 days later; and 3) sending a second cover letter and another copy of the questionnaire to those who had not yet returned the survey 10 days after the reminder postcard was sent out. All boaters who provided their names and addresses on the intercept survey were included in the mail survey phase of the study.

Of the 2360 river runners contacted, 2248 completed the intercept survey for a 95% response rate [Table 83]. About 62% (1394) also agreed to participate in the mail survey and provided their correct names and addresses. Surveys and two reminders were mailed to these boaters in the summer and fall of 1999. We received 802 responses for a 58% response rate to the mail survey, ranging from 43% for the Colorado Daily sample to 73% for the San Juan Lower sample. Therefore, the following discussion on the mail survey results represents about 36% of all the boaters contacted during the sampling period (Reiter & Blahna, 2001, pp. III.5-III.6).

2004 Front Country Visitor Study for Grand Staircase-Escalante National Monument

From Burr, Blahna, Reiter, Leary, and Wagoner (2006)

Survey Design and Sampling Design

For Phase I of this study, the survey instruments and sampling design were initially developed in collaboration with Monument staff. During Phase I the survey instruments and the sampling design were pilot tested. From the results of this first year pilot study, the survey instruments and sampling design for Phase II were developed.

Three intercept survey instruments were used in this study: recreation site in the Monument, Monument visitor center, and Scenic Byway 12 overlook

TABLE 83 Utah River Study: River Survey Sampling Days and Intercept and Mail Survey Response Rate

	San Juan River			Green River				Colorado River		
	upper	lower	White R.	Brown's	daily	Labyrinth	Desolation	daily	West-water	total
Days in sampling period										
weekend	4	5	2	5	14	8	14	10	12	74
weekday	13	13	6	12	24	18	24	17	27	156
Number of contacts	137	185	50	157	173	158	265	667	568	2360
Completed intercept surveys										
weekend	23	52	-	75	78	50	77	293	142	790
weekday	103	124	47	69	74	99	183	345	414	1458
total	126	176	47	144	152	149	260	638	556	2248
Intercept response rate	92.0%	95.1%	94.0%	91.7%	87.9%	94.3%	98.1%	95.7%	97.9%	95.3%
Number of addresses	62	136	33	106	83	92	183	378	362	1435
Percentage of addresses	49.2%	77.3%	70.2%	73.6%	54.6%	61.7%	70.4%	59.2%	65.1%	63.8%
Undeliverable addresses	3	1	0	3	1	2	4	7	19	40
Legitimate addresses	59	135	33	103	82	90	179	371	343	1395
Mail surveys returned	40	99	23	49	45	54	119	159	214	802
Mail survey response rate	67.8%	73.3%	69.7%	47.6%	56.0%	60.0%	66.5%	42.9%	62.4%	57.5%

Note. Table reformatted from Table II-B.1 in Reiter et al. (2001[a]).

surveys. These surveys contained many similar questions, but differed slightly for each type of site. The last two pages of the recreation site survey included questions regarding visitors' expectations, impressions, and activities participated in while at that survey site, while the last two pages of the visitor center survey included questions regarding visitors' impressions of and satisfaction with the facility, displays, and staff at the visitor center survey site. The overlook survey consisted of the same questions asked in the main sections of the recreation site and visitor center surveys. However, a trip route mapping exercise that was included in the other surveys was omitted from the overlook survey due to the

amount of time it took to complete in relation to the typical amount of time visitors actually spent at the overlooks.

The main sections of the three intercept surveys contained questions regarding group size, length of stay, residence, overall trip route (mapping exercise), activities participated in, impressions, expectations, and satisfactions while visiting the Monument (see [Appendix B] for copies of the intercept surveys). The recreation site and visitor center surveys included a mapping exercise where the intent was to the attain the most accurate description of the respondent's trip route up to the point when the visitor was surveyed, as well as the visitor's planned trip route following the interview. During this exercise, visitors were asked to point out any sites or visitor centers they had already stopped at, as well as those they were planning to stop and where they were planning to go once they left the Monument area…

During the intercept survey data collection effort, 1,751 visitors were asked if they would be willing to participate in a more detailed follow-up mail survey. A mailing list was compiled of all visitors who agreed to participate in the mail survey and provided an address (n = 1,148). A three wave mailing design was employed following the outline provided by Dillman (2001). A mail survey accompanied by a cover letter was sent to all visitors on the mailing list as the first wave mailing. Two weeks later, as the second wave mailing, a postcard reminder was sent to all visitors who had not completed and returned the survey sent in the first wave. About one to two weeks following the postcard reminder, another blank survey with an updated cover letter was sent to any remaining visitors who had not yet returned a completed survey.

The mail survey included more detailed questions regarding visitor characteristics, past experience, expectations, satisfactions, Monument images, and expenditures. The survey instrument itself was nine pages long and included a mapping exercise similar to the one used in the intercept survey (pp.16-17).

Data Collection Process

Data were gathered from visitors from late March through mid October in 2004, using a random systematic selection of dates. Intercept surveys were conducted at 27 pre-determined sites within the Front Country and Passage Zones of the GS-ENM (Figure 3). Surveys were conducted at five visitor centers and three overlooks adjacent to the Monument, and 19 recreation sites (trailheads, scenic attractions, roads, and campgrounds) located directly on the GS-ENM. A breakdown of sample sites by each the type of location and a complete list of contact points and dates are included in Appendix C. Visitors to the three campgrounds (Calf Creek, Deer Creek, Whitehouse) were sampled during the same time block as the respective trailheads at these locations. Visitors were approached by researchers after completing activities at each site, while campers were approached at their campsites. Researchers conducted intercept surveys in an interview style with those visitors who agreed to participate in the study (p. 18).

Survey Response

As shown in [Table 84], there were 27 locations where the intercept surveys were administered. Of the 2,306 respondents contacted, 2,062 (89.4%) agreed to be interviewed [Table 85]. This included 83% (n = 602) at visitor centers, 90% (n = 887) at overlooks, and 96% (n = 573) at recreation sites.

Of the 2,062 respondents who agreed to the intercept interview, 1,751 (84.9%) were asked if they would be willing to receive and complete the follow-up mail-back survey. Overall, 555 respondents were not asked if they would be willing to participate in the mail survey because they refused to participate in the intercept survey (n = 244) or they were overlook visitors who told the interviewer that they were just passing through or commuting to work (n = 311), allowing the visitor to skip the section asking for mailing information and participation in the mail survey. Of the 1,170 (66.8%) respondents who said they would be willing to complete a mail survey (581 refused), 1,148 gave the interviewer their name and a useable mailing address. Of those, 766 respondents completed and returned the survey for a response rate of 67.6% [Table 85] (p. 19).

TABLE 84 2004 Front Country Visitor Study for Grand Staircase-Escalante National Monument: Intercept Survey Sites

Monument Recreation Sites					
Campgrounds	Scenic Attractions	Roads	Campgrounds	Visitor Centers	Overlooks
Calf Creek	Devils Garden	Burr Trail	Calf Creek	Big Water	Blues
Deer Creek	Grosvenor Arch	Cottonwood Road Pull-Off	Deer Creek	Boulder	Boynton
Dry Fork	Left Hand Collet	Johnson Canyon Road Kiosk	Whitehouse	Cannonville	Head of the Rocks
Escalante River	Paria Movie Set	Smokey Mountain Road Kiosk		Escalante	
Harris Wash				Kanab	
Lower Hackberry					
Whitehouse					
Wire Pass					

Note. Table reformatted from Table 1 in Burr et al. (2006).

TABLE 85 2004 Front Country Visitor Study for Grand Staircase-Escalante National Monument: Sampling Days and Intercept and Mail Survey Response Rates

	Monument recreation sites						
	trailheads	scenic attractions	roads	camp-grounds	Visitor centers	Overlooks	Total
Days in sampling period							
weekend	25	14	19	9	30	15	45
weekday	56	35	42	25	63	38	96
Number of contacts	272	213	84	28	724	985	2306
Completed intercept surveys							
weekend	103	66	28	17	230	264	708
weekday	157	139	53	10	371	623	1353
total	260	205	81	27	602[a]	887	2062
Intercept response rate	95.6%	96.2%	96.4%	96.4%	83.1%	90.1%	89.4%
Number of addresses	193	149	61	22	395	328	1148[c]
Percentage of addresses	74.2%	72.7%	75.3%	81.5%	65.6%	56.9%[b]	65.6%
Mail surveys returned	132	99	40	13	263	219	766
Mail survey response rate	68.4%	66.4%	65.6%	59.1%	66.6%	66.8%	66.7%

[a]One survey was missing the date it was completed.

[b]Of the 887 overlook respondents, 311 were no asked is the would like to do a mail survey.

[c]Of the 2,306 visitors contacted, 555 (24.1%) were not asked to participate in the mail survey because they refused the intercept survey (n = 244; 10.6%) or were overlook visitors who indicated that they were just passing through or going to work (n = 311; 13.5%); of the 1,751 who wee asked if they would do a mail survey, 581 (33.2%) said no and 1,170 said yes; of those who said yes, 22 (1.9%) invalid addresses (undeliverable).

Note. Table reformatted from Table 2 in Burr et al. (2006).

2006 Saint Anthony Sand Dunes Visitor Use Surveys

From Wagoner, Blahna, Burr, and Reiter (in press)

Sample Population and Sampling Locations

The intercept and mail surveys were intended to capture a random, representative sample of visitors to BLM managed areas in and around the SASD recreation area. The survey was administered to visitors at least 18 years of age and capable of understanding either a spoken or written version of the survey instrument. Only one visitor per group (the visitor's group was self-determined) was asked to complete both the intercept and mail survey. Researchers requested that the first individual they encounter as they approached the group who was

eligible to complete the survey do so. In this way, the member was randomly selected.

Because of the relatively compact nature and restricted access points associated with SASD, the majority of recreationists could be sampled by covering eight locations [for graphical presentation of survey locations see Wagoner et al., in press]. Survey locations included three day use parking areas, two developed overnight camping/RV areas, two short stretches of dune-abutting road with dispersed undeveloped camping/RVing and dune access, and one high-use lava tube cave. [Table 86] lists the number of surveys collected at each of the eight sampling locations. A ninth location, The Sand Hills Resort RV Park, was originally included in the sampling schedule; however, the private owner of this sampling site revoked access permission. On sampling days that would have included this site, one of the two high-turnover day use locations was alternatingly sampled in its place.

The original nine sampling locations were divided into three sampling groups (A, B, and C), with each group representing a full day of surveying [for graphical presentation of survey locations see Wagoner et al., in press]. Two of the three sampling locations in each sampling group were placed together due to their proximity to one another. By having these sites so close, a single researcher was able to cover both locations with little chance of missing recreationists (pp. 7-8).

Response Rates

[Table 86] show[s] the response rates for both the intercept and mail surveys, broken down by survey location and type (day use or overnight) [for

TABLE 86 2006 Saint Anthony Sand Dunes Visitor Use Surveys: Number of Each Type of Intercept Survey Administered by Sampling Location

Location	Day Use	Overnight	Decline	Site Response Rate	Percent of Total Contacts
Desert Oasis	1	136	5	96.5%	22.2%
Egin Over Night	4	93	7	93.3%	16.3%
Egin Day Use	150	26	15	92.1%	29.9%
Egin-Hamer Road	20	1	5	81.0%	4.1%
Red Road Dispersed	49	43	9	91.1%	15.8%
Red Road Day Use	41	3	6	88.0%	7.8%
Civil Defense Cave	20	2	0	100.0%	3.4%
Taylor-Well Road	1	0	0	100.0%	0.2%
White Sands Road	1	0	0	100.0%	0.2%
Sub-Totals	288	304	47		
Totals	Accepted 92.6%[a]		Declined 7.4%		

[a]One intercept survey was completed but no location was marked, this survey has been omitted from the figures presented in this table.

Note. Table reformatted from Table I1 in Wagoner et al. (2006).

details of mail surveys and key informant interviews see Wagoner et al, in press]. Most surveys were administered at four of the nine sampling sites—Egin Day Use, Desert Oasis, Egin Overnight, and Red Road Dispersed—but this reflects the highly concentrated use at SASD, not over sampling at these locations. The overall response rate for the Intercept Survey (92.6%; n=592) was better than had been expected based on previous motorized recreation studies, (Reiter et al., 1998; Vilter et al., 1996; McCoy et al., 2001)… (p. 11).

1999 Utah State Park Boater Telephone Survey

From Reiter, Blahna, Smith, and Bahr (2001[b])

The [Utah Division of Parks and Recreation] provided USU researchers with an electronic file of all boats registered in Utah during 1999. That list included the boat owner's name and address. Duplicate names were removed to provide a list of the population of Utah boat owners, and to provide a single, equal opportunity for each registered boat owner to be selected for participation in the survey. A sample was drawn using a computer random sampling program. In order to obtain a 95% sampling confidence interval, it was calculated that a random sample of 350 respondents was needed to complete the survey.

Research technicians conducted the survey by calling respondents between 6:00 pm and 9:00 pm on weeknights and during the afternoon hours on weekends. They identified themselves as USU students engaged in a research survey, asked the respondent if they would participate in the study, and assured the respondent that their identity would be kept confidential [see survey instrument in Appendix B]. Telephone interviews began in November 1999 and were completed during the first part of May 2000 when the sample size of 350 was attained. Data was entered and subsequent statistical analytical procedures conducted using computers and programs at USU's Institute of Outdoor Recreation and Tourism. The number of registered boats (including sailboats) in Utah in 1999 was 77,171 and the number of registered boat *owners* was 58,289 [Table 87]. The original sample selected for the survey was 991 people, about 1.7% of the total number of registered boaters. Due to disconnected and unlisted phone numbers 430 of these people were listed as non-contactable. The remaining 561 people were called up to six times or until they completed a survey. The number of completed surveys was 350 for a 62.4% response rate, the others were considered not available, no answers, or rejections [see Table 87]. The relatively high number of respondents with no phones or with unlisted numbers may indicate that non-permanent, seasonal residents may be under represented in the survey results.

TABLE 87 1999 Utah State Park Boater Telephone Survey: Utah Registered Boat Owners' Population and Sample Distribution

Group	Number	Percentage of Group
Number of registered boat owners in Utah	77171[a]	100.0% of registered boats
Population of Utah registered boat owners	58289	100.0% of population
Original Sample	991	1.7% of registered boat owners
Non-contactable[b]	430	43.4% of original sample
Valid phone numbers (final sample)	561	56.6% of original sample
Respondents	350	62.4% of final sample
Non-respondents[c]	211	37.6% of final sample

[a]Taken from State of Utah, registered boat owners lists, 1999, supplied by the Utah Division of Parks and Recreation.

[b]This includes no phone numbers (377), as well as disconnected or moved (34) and wrong numbers (19).

[c]This includes no answers (45), answering machines (5), unavailable respondent (37) and rejection (124).

Note. Table reformatted from Table II.1 in Reiter et al. (2001[b]).

2006 Utah State Park Boating Survey (telephone survey)

From Spain, Reiter, Blahna, and Burr (2007)

> [Utah] State Parks provided USU researchers with an electronic file of all boats registered in Utah during 2005. That list included the boat owner's name and address. Duplicate names were removed to provide a list of the population of Utah boat owners, and to provide a single, equal opportunity for each registered boat owner to be randomly selected for participation in the survey. A sample was drawn using a computer random sampling program. In order to obtain a 95% confidence level with a +/-5% confidence interval, it was calculated a random sample of 385 respondents was needed to complete the survey.
>
> A simple random sample was drawn and businesses and individuals without listed phone numbers were removed. The original sample selected for the survey was 1140 people who had listed telephone numbers. Due to disconnected [phones] and phones that went unanswered, 485 of these people were listed as non-contactable. The remaining 655 people were called up to 11 times until they either completed a survey or declined to participate. The number of completed surveys was 397 for a 60.6% response rate; the others were considered non-responses. The relatively high number of respondents with no phones or with unlisted numbers may indicate that non-permanent, seasonal residents and those that rely primarily on cell phones are likely underrepresented in the sample results.
>
> Discovery Research Group Inc. was contacted to conduct the telephone survey. The survey was conducted during the off-season (Fall 2006 / Winter 2007) utilizing a CATI [Computer Aided Telephone Interviewing] program. The average survey took a little less than 18 minutes and the response rate was about

60%. Discovery Research Group entered the data and sent [it] to IORT researchers at Utah State University (pp. 16-17).

Appendix B

Survey Instruments

1999 Utah State Park Boater Intercept Survey Instrument

1999 State Park Boater Intercept Survey *No.* _____

Date: _____ *Day:* M Tu W Th F Sa Su *Time:* 9 10 11 12 1 2 3 4 6 7 8 9

Location: _____ Deer Creek (north) _____ Jordanelle (main) _____ Willard (north) _____ East Canyon
_____ Deer Creek (south) _____ Jordanelle (pwc) _____ Willard (south)

Parking Lot: ❑ < ¼ full ❑ ¼ to ½ full ❑ ½ to ¾ full ❑ > ¾ full

Watercraft: 1 Open motorboat 3 Personal watercraft 5 Sail (only) 7 Canoe
2 Cabin motorboat 4 Auxiliary sail 6 Rowboat 8 Other: _____

Gender: Male [ ] Female [ ] *Age:* _____ *Interview Result:* Completed [ ] Partial [ ] Refused [ ]

1. Where are you from? (city/town, county, state): _____

2. Are you the boat owner or primary operator? ❑ NO ❑ YES

3. About how much fuel did you use today? _____ gallons

4. How many people are in your group today? _____

5. Have you visited [LAKE NAME] before? ❑ YES ❑ NO → [GO TO Q6]

   5a. [IF YES] Before **this** year, for how many years have you been coming out to [LAKE]? _____
   5b. [IF MORE THAN 1 YEAR] How many times do you come out here in a **typical** year? _____

6. I'm going to read a list of boating activities you may have participated in today. Please tell me which of the activities someone in your group did. [CHECK ALL THAT APPLY]

   ❑ Water skiing, tubing, or knee boarding
   ❑ Riding on personal watercraft
   ❑ Swimming from a boat
   ❑ Sailing
   ❑ Sightseeing on the lake
   ❑ Canoeing or kayaking
   ❑ Trolling
   ❑ Still fishing from a boat
   ❑ Cruising or just driving the boat for fun
   ❑ Other boating activities: _____

7. [IF MORE THAN ONE ACTIVITY] Which of these was your **primary** activity? [CIRCLE ABOVE]

8. What was the main reason you decided to come out to [LAKE NAME] today? _____
   _____
   _____
   [PROBE FOR UP TO TWO REASONS]

9. In general, how satisfied were you with your recreation experience here today? Would you say you were:
   ❑ very satisfied, ❑ satisfied, ❑ neutral, ❑ dissatisfied, or ❑ very dissatisfied?

   9a. [IF DISSATISFIED] What were the problems? _____
   _____
   [**PROBE:** "Did you have any other problems on the lake today?" or "Anything else?"]

10. Do you feel that the actions of some lake users detract from your enjoyment while you're boating on [LAKE NAME]?

❑ YES ❑ POSSIBLY ❑ NO → **[IF NO, GO TO Q11]**

10a. In *general*, how often is your enjoyment of [LAKE] reduced by the actions of others? Would you say…
- ❑ rarely (by that I mean on *some trips but not on every trip* to the lake),
- ❑ sometimes (once or twice a day), or
- ❑ often (more than twice a day).
- ❑ DK OR NEVER BEEN HERE BEFORE

10b. Which types of groups or lake users detract from your enjoyment?

_____

[PROBE: "DO ANY OTHER GROUPS DETRACT FROM YOUR ENJOYMENT?"]

11. In your opinion, do you feel that there were too many, too few, or about the right number of boaters on the lake *today*?

❑ TOO MANY ❑ TOO FEW ❑ ABOUT RIGHT

12. In *general*, do you think there is a need to put a limit on the number of boats that can use [LAKE NAME] at one time? Would you say:
- ❑ definitely yes,
- ❑ probably yes,
- ❑ probably no, or →
- ❑ definitely no. → **Go to question #14**
- ❑ DON'T KNOW →

13. **[IF YES TO Q12]** Why do you feel that use limits are needed at [LAKE]?

_____

_____

[PROBE UNTIL NO MORE REASONSARE GIVEN]

14. If you were not able to get on the lake as a result of restrictions on the number of boats *today*, do you think you still would have gone boating elsewhere or done something else?

- ❑ BOATING (DEFINITELY) →→→ Where do you think you would have gone boating?
- ❑ BOATING (PROBABLY) →→→ _____
- ❑ SOMETHING ELSE
- ❑ UNSURE
- ❑ NO

15. Do you have any additional comments or recommendations for future management of [LAKE NAME]?

_____

_____

That's the end of the survey – **Thank you very much for your help!**

1999 State Park Boater Intercept Survey

2001 Utah State Park Boater Intercept Survey Instrument

2001 State Park Boater Intercept Survey

No. _____ | | | |

Date: _____ *Day:* M Tu W Th F Sa Su *Time:* 9 10 11 12 1 2 3 4 6 7 8 9

Location: _____ Hyrum _____ Pineview (port) _____Bear Lake (marina) _____ Bear Lake (eastside south)
_____ Echo _____ Pineview (cemetery) _____ Bear Lake (eastside north)

Parking Lot: ❑ < ¼ full ❑ ¼ to ½ full ❑ ½ to ¾ full ❑ > ¾ full

Watercraft: 1 Open motorboat 3 Personal watercraft 5 Sail (only) 7 Canoe
2 Cabin motorboat 4 Auxiliary sail 6 Rowboat 8 Other: _____

Gender: Male [ ] Female [ ] *Age:* _____ *Interview Result:* Completed [ ] Partial [ ] Refused [ ]

1. Where are you from? (city/town, county, state): _____

2. Are you the boat owner or primary operator? ❑ NO ❑ YES

3. About how much fuel did you use today? _____ gallons

4. How many people are in your group today? _____

5. Have you visited [LAKE NAME] before? ❑ YES ❑ NO → [GO TO Q6]

   5a. [IF YES] Before **this** year, for how many years have you been coming out to [LAKE]? _____
   5b. [IF MORE THAN 1 YEAR] How many times do you come out here in a **typical** year? _____

6. I'm going to read a list of boating activities you may have participated in today. Please tell me which of the activities someone in your group did. [CHECK ALL THAT APPLY]

   ❑ Water skiing, tubing, or knee boarding
   ❑ Riding on personal watercraft
   ❑ Swimming from a watercraft
   ❑ Sailing
   ❑ Sightseeing on the lake
   ❑ Canoeing or kayaking
   ❑ Trolling
   ❑ Still fishing from a boat
   ❑ Cruising or just driving the boat for fun
   ❑ Other boating activities: _____

7. [IF MORE THAN ONE ACTIVITY] Which of these was your **primary** activity? [CIRCLE ABOVE]

8. What was the main reason you decided to come out to [LAKE NAME] today? _____
_____
_____
[PROBE FOR UP TO TWO REASONS]

9. In general, how satisfied were you with your recreation experience here today? Would you say you were:

   ❑ very satisfied, ❑ satisfied, ❑ neutral, ❑ dissatisfied, or ❑ very dissatisfied?

   9a. [IF DISSATISFIED] What were the problems? _____
_____
[**PROBE:** "Did you have any other problems on the lake today?" or "Anything else?"]

10. Do you feel that the actions of some lake users detract from your enjoyment while you're boating on [LAKE NAME]?

❑ YES ❑ POSSIBLY ❑ NO → **[IF NO, GO TO Q11]**

10a. In *general*, how often is your enjoyment of [LAKE] reduced by the actions of others? Would you say…

- ❑ rarely (by that I mean on *some trips but not on every trip* to the lake),
- ❑ sometimes (once or twice a day), or
- ❑ often (more than twice a day).
- ❑ DK OR NEVER BEEN HERE BEFORE

10b. Which types of groups or lake users detract from your enjoyment?

_____

[PROBE: "DO ANY OTHER GROUPS DETRACT FROM YOUR ENJOYMENT?"]

11. In your opinion, do you feel that there were too many, too few, or about the right number of boaters on the lake *today*?

❑ TOO MANY ❑ TOO FEW ❑ ABOUT RIGHT

12. In *general*, do you think there is a need to put a limit on the number of boats that can use [LAKE NAME] at one time? Would you say:

- ❑ definitely yes,
- ❑ probably yes,
- ❑ probably no, or →
- ❑ definitely no. →
- ❑ DON'T KNOW →

Go to question #15

13. **[IF YES TO Q12]** Why do you feel that use limits are needed at [LAKE]?

_____

_____

[PROBE UNTIL NO MORE REASONSARE GIVEN]

14. **[IF YES TO Q12]** Are there any specific boating groups whose use you think should be limited?

❑ NO ❑ YES → [IF YES] Who is that? _____

Anyone else? _____

15. If you were not able to get on the lake as a result of restrictions on the number of boats *today*, do you think you still would have gone boating or done something else?

- ❑ BOATING (DEFINITELY) →→→ Where do you think you would have gone?
- ❑ BOATING (PROBABLY) →→→ _____
- ❑ SOMETHING ELSE
- ❑ UNSURE

21. Do you have any additional comments or recommendations for future management of [LAKE NAME]?

_____

_____

That's the end of the survey – **Thank you very much for your help!**

2001 Mystic Lakes Recreational Visitors Survey

Boater Survey Instrument

No. _____ | | | | | | OMB #0596-0108

MYSTIC LAKES BOATER SURVEY

Date: _____ *Day:* M Tu W Th F Sa Su *Time:* 9 10 11 12 1 2 2 3 4 6 7 8 9

Location: ____ Sheridan _____ Pactola _____ Ramp

Parking Lot: • •< ¼ full • •¼ to ½ full • •½ to ¾ full • •¾ to full • •over capacity

Watercraft: 1 Open motorboat 3 Personal watercraft 5 Sail (only) 7 Canoe
2 Cabin motorboat 4 Auxiliary sail 6 Rowboat 8 Other: _____

Gender: • •Male • •Female *Age:* _____ *Interview Result:* • •Completed • •Partial • •Refused

1. Where are you from? (city/town, county, state): _____

2. Are you the boat owner or primary operator? • •NO • •YES

3. How many people are in your group today? _____

4. How long is your visit to [LAKE NAME]? _____hours **OR** _____days

5. Have you visited [LAKE NAME] before? • • YES • •NO • •[GO TO Q6]

   5a. [IF YES] Before this year, for how many years have you been coming out to [LAKE]? _____
   5b. [IF MORE THAN 1 YEAR] How many times do you come out in a typical year? _____

6. I'm going to read a list of boating activities you may have participated in today. Please tell me which of the activities someone in your group did. [CHECK ALL THAT APPLY]

   • •Water skiing, tubing, or knee boarding
   • •Riding on personal watercraft
   • •Swimming from a watercraft
   • •Sailing
   • •Sightseeing on the lake
   • •Canoeing or kayaking
   • •Trolling
   • •Still fishing from a boat
   • •Cruising or just driving the boat for fun
   • •Other boating activities: _____

7. [IF MORE THAN ONE ACTIVITY] Which of these was your primary activity? [CIRCLE ABOVE]

8. What was the main reason you decided to come out to [LAKE NAME] today? _____

_____

_____

[PROBE FOR UP TO TWO REASONS]

9. In general, how satisfied were you with your recreation experience here today? Would you say you were:

   • •very satisfied, • •satisfied, • •neutral, • •dissatisfied, or • •very dissatisfied?

9a. [IF DISSATISFIED] What were the problems? _____

_____

_____

[**PROBE**: "Did you have any other problems on the lake today?" or "Anything else?"]

10. Do you feel that the actions of some lake users detract from your enjoyment while you're boating on [LAKE NAME]?

• •YES • •POSSIBLY • •NO • •**[IF NO, GO TO Q11]**

10a. In *general*, how often is your enjoyment of [LAKE] reduced by the actions of others? Would you say:

- • • rarely (by that I mean on *some trips but not on every trip* to the lake).
- • • sometimes (once or twice a day), or
- • • often (more than twice a day).
- • • DK OR NEVER BEEN HERE BEFORE

10b. Which types of groups or lake users detract from your enjoyment? _____

What did they do? _____

Can you think of any other group that detracted from your enjoyment? _____

What did they do? _____

11. In your opinion, do you feel that there were too many, too few, or about the right number of boaters on the lake *today*?

• •TOO MANY • •TOO FEW • •ABOUT RIGHT

12. In *general*, do you think there is a need to put a limit on the number of boats that can use [LAKE NAME] at one time? Would you say:

- • • definitely yes,
- • • probably yes,
- • • probably no, or • •
- • • definitely no. • •
- • • DON'T KNOW • •

Go to question #15

13. [**IF YES TO Q12**] Why do you feel that use limits are needed at [LAKE]?

_____

_____

[PROBE UNTIL NO MORE REASONSARE GIVEN]

14. [**IF YES TO Q12**] Are there any specific boating groups whose use you think should be limited?

• •NO • •YES • •[IF YES] **Who is that?** _____
Anyone else? _____

15. If you were not able to get on the lake as a result of restrictions on the number of boats *today*, do you think you still would have gone boating or done something else?

- BOATING (DEFINITELY) — **Where do you think you would have gone?**
- BOATING (PROBABLY) _____
- SOMETHING ELSE [PROBE FOR UP TO THREE LAKES]
- UNSURE

16. In general at [LAKE NAME] would you rate the physical impacts on land or water caused by the number of boaters as:

- VERY LOW,
- MODERATELY LOW,
- CURRENTLY ACCEPTABLE,
- MODERATELY HIGH, or _____
- VERY HIGH? _____

What impacts come to mind when you say HIGH?

17. How satisfied are you with the boating facilities at [LAKE NAME]?
- very satisfied, - satisfied, - neutral, - dissatisfied, or - very dissatisfied?

17a. What boating facility improvements would you like to see? _____

_____

_____
[PROBE FOR UP TO THREE TYPES OF FACILITY IMPROVEMENTS]

18. Can you think of any management services or policy changes you would like to see that would enhance your boating experience at [LAKE NAME]?

_____

_____
[PROBE FOR UP TO THREE SERVICE OR POLICY CHANGES]

19. On this trip, did you or are you planning on camping at [LAKE NAME]? - NO - YES

20. What type of campsite would you prefer to use when visiting [LAKE NAME]?
- I never plan on camping here
- Undeveloped sites (no toilets or other facilities
- Semi-developed sites with pit toilets and fire rings
- Developed sites with pit toilets, picnic tables, and fire grills
- Highly developed sites with flush toilets, showers, running water, and utility hookups

21. Do you have any additional comments or recommendations for future management of [LAKE NAME]?

_____

_____

That's the end of the survey – **Thank you very much for your help!**

Mystic Lakes Recreational Visitors Survey

Recreation Survey Instrument

No. _____ | | | | | OMB #0596-0108

MYSTIC LAKES RECREATION SURVEY

Date: _____ *Day:* M Tu W Th F Sa Su *Time:* 9 10 11 12 1 2 2 3 4 6 7 8 9

Location: ____ Sheridan _____ Pactola _____ Area or Campground

Parking Lot: • • < ¼ full • • ¼ to ½ full • • ½ to ¾ full • • ¾ to full • • over capacity

Activity: 1 Shore fishing 3 Snorkeling 5 Camping 7 Scuba diving
2 Swimming 4 Sailboarding 6 Picnicking 8 Other: _____

Gender: • • Male • • Female *Age:* _____ *Interview Result:* • • Completed • • Partial • • Refused

1. Where are you from? (city/town, county, state): _____

2. How many people are in your group today? _____

3. How long is your visit to [LAKE NAME] today? _____ hours **OR** _____ days

4. Have you visited [LAKE NAME] before? • • YES • • NO • • [GO TO Q5]

   4a. [IF YES] Before this year, for how many years have you been coming out to [LAKE]? _____
   4b. [IF MORE THAN 1 YEAR] How many times do you come out in a typical year? _____

5. I'm going to read a list of outdoor recreation activities you may have participated in today. Please tell me which of the activities someone in your group did. [CHECK ALL THAT APPLY]

• • Fishing from the shore	• • Picnicking	• • Jet skiing
• • Swimming from the shore	• • Scuba diving	• • Motorboating
• • Snorkeling	• • Hiking	• • Canoeing/kayaking
• • Wildlife viewing	• • Backpacking	
• • Camping	• • Waterskiing	• • Other: _____

6. [IF MORE THAN ONE ACTIVITY] Which of these was your **primary** activity? [CIRCLE ABOVE]

7. What was the main reason you decided to come out to [LAKE NAME] today? _____

_____

_____

[PROBE FOR UP TO TWO REASONS]

8. In general, how satisfied were you with your recreation experience here today? Would you say you were:

• • very satisfied, • • satisfied, • • neutral, • • dissatisfied, or • • very dissatisfied?

8a. [IF DISSATISFIED] What were the problems? _____

_____

_____

[**PROBE**: "Did you have any other problems out here today?" or "Anything else?"]

9. Do you feel that the actions of some lake users detract from your enjoyment while you're recreating at [LAKE AREA]?

• •YES • •POSSIBLY • •NO • •**[IF NO, GO TO Q10]**

9a. In *general*, how often is your enjoyment of [AREA] reduced by the actions of others? Would you say:

- • • rarely (by that I mean on *some trips but not on every trip* to the lake).
- • • sometimes (once or twice a day), or
- • • often (more than twice a day).
- • • DK OR NEVER BEEN HERE BEFORE

9b. Which types of groups or lake users detract from your enjoyment? _____

What did they do? _____

Can you think of any other group that detracted from your enjoyment? _____

What did they do? _____

10. In your opinion, do you feel that there were too many, too few, or about the right number of people in this area *today*?

• •TOO MANY • •TOO FEW • •ABOUT RIGHT

[IF INTERVIEWEE IS A CAMPER, SKIP QUESTIONS #11 AND #12]

11. In *general*, do you think there is a need to put a limit on the number of people that can use [LAKE AREA] at one time? Would you say:

- • • definitely yes,
- • • probably yes,
- • • probably no, or • •
- • • definitely no. • •
- • • DON'T KNOW • •

Go to question #13

12. **[IF YES TO Q11]** Why do you feel that use limits are needed at [LAKE AREA]?

_____

_____

[PROBE UNTIL NO MORE REASONSARE GIVEN]

13. **[IF YES TO Q11 AND CAMPERS]** Are there any specific groups whose use you think should be limited?

• •NO • •YES • •[IF YES] Who is that? _____

Anyone else? _____

14. If you were not able to get on the lake as a result of restrictions on the number of people *today*, do you think you still would have gone to another [CAMPGROUND OR BEACH] or done something else?

- GONE [TO A BEACH OR CAMPING] (DEFINITELY) — Where do you think you would have gone?
- GONE [TO A BEACH OR CAMPING] (PROBABLY) _____
- SOMETHING ELSE [PROBE FOR UP TO THREE AREAS]
- UNSURE

15. In general, would you rate the physical impacts on [BEACH OR CAMPGROUND] caused by the number of people as:

- VERY LOW,
- MODERATELY LOW,
- CURRENTLY ACCEPTABLE,
- MODERATELY HIGH, or _____
- VERY HIGH? _____

What impacts come to mind when you say HIGH?

16. How satisfied are you with the [BEACH OR CAMPGROUND] facilities?

very satisfied satisfied neutral dissatisfied, or very dissatisfied

16a. What recreation facility improvements would you like to see? _____

_____

_____

17. Can you think of any management services or policy changes that would enhance your recreation experience at [BEACH OR CAMPGROUND]?

_____

_____

[PROBE FOR UP TO THREE SERVICE OR POLICY CHANGES]

18. [**NON-CAMPERS ONLY**] On this trip, did you or are you planning on camping at [LAKE NAME]?

NO YES

19. What type of campsite would you prefer to use when visiting [LAKE NAME]?

- I never plan on camping here
- Undeveloped sites (no toilets or other facilities
- Semi-developed sites with pit toilets and fire rings
- Developed sites with pit toilets, picnic tables, and fire grills
- Highly developed sites with flush toilets, showers, running water, and utility hookups

20. Do you have any additional comments or recommendations for future management of [LAKE NAME]?

_____

_____

That's the end of the survey – **Thank you very much for your help!**

2001 Mystic Lakes Recreational Visitors Survey

Pactola Lake Slipholder Boater Survey Instrument

No. _____ OMB #0596-0108

PACTOLA LAKE SLIPHOLDER BOATER SURVEY

Date: _____ *Day:* M Tu W Th F Sa Su *Time:* 9 10 11 12 1 2 3 4 6 7 8 9

Watercraft: 1 Open motorboat 3 Personal watercraft 5 Sail (only) 7 Canoe
2 Cabin motorboat 4 Auxiliary sail 6 Rowboat 8 Other: _____

Gender: • •Male • •Female *Age:* _____ *Interview Result:* • •Completed • •Partial • •Refused

1. Where are you from? (city/town, county, state): _____

2. Are you the boat owner or primary operator? • •NO • •YES

3. How many people were in your group that day? _____

4. How long was your visit to Pactola? _____hours **OR** _____days

5. Have you visited Pactola before? • • YES • •NO • •[GO TO Q6]

   5a. [IF YES] Before this year, for how many years have you been coming out to Pactola? _____
   5b. [IF MORE THAN 1 YEAR] How many times do you come out in a typical year? _____

6. I'm going to read a list of boating activities you may have participated in that day. Please tell me which of the activities someone in your group did. [CHECK ALL THAT APPLY]

   • •Water skiing, tubing, or knee boarding
   • •Riding on personal watercraft
   • •Swimming from a watercraft
   • •Sailing
   • •Sightseeing on the lake
   • •Canoeing or kayaking
   • •Trolling
   • •Still fishing from a boat
   • •Cruising or just driving the boat for fun
   • •Other boating activities: _____

7. [IF MORE THAN ONE ACTIVITY] Which of these was your **primary** activity? [CIRCLE ABOVE]

8. What was the main reason you decided to come out to Pactola on that day? _____

_____

_____
[PLEASE LIST UP TO TWO REASONS]

9. In general, how satisfied were you with your recreation experience? Would you say you were:

   • •very satisfied, • •satisfied, • •neutral, • •dissatisfied, or • •very dissatisfied?

9a. [IF DISSATISFIED] What were the problems? _____

_____

_____

"Did you have any other problems on the lake today?"

10. Do you feel that the actions of some lake users detract from your enjoyment while you're boating on Pactola?

• •YES • •POSSIBLY • •NO • •**[IF NO, GO TO Q11]**

10a. In *general*, how often is your enjoyment of Pactola reduced by the actions of others? Would you say:
- • • rarely (by that I mean on *some trips but not on every trip* to the lake).
- • • sometimes (once or twice a day), or
- • • often (more than twice a day).
- • • DK OR NEVER BEEN HERE BEFORE

10b. Which types of groups or lake users detract from your enjoyment? _____

What did they do? _____

Can you think of any other group that detracted from your enjoyment? _____

What did they do? _____

11. In your opinion, do you feel that there were too many, too few, or about the right number of boaters on the lake *that day*?

• •TOO MANY • •TOO FEW • •ABOUT RIGHT

12. In *general*, do you think there is a need to put a limit on the number of boats that can use Pactola at one time? Would you say:
- • • definitely yes,
- • • probably yes,
- • • probably no, or • •
- • • definitely no. • •
- • • DON'T KNOW • •

Go to question #15

13. **[IF YES TO Q12]** Why do you feel that use limits are needed at Pactola?

_____

_____

[PLEASE LIST UP TO 3 REASONS]

14. **[IF YES TO Q12]** Are there any specific boating groups whose use you think should be limited?

• •NO • •YES • •[IF YES] **Who is that?** _____

Anyone else? _____

15. If you were not able to get on the lake as a result of restrictions on the number of boats *that day*, do you think you still would have gone boating or done something else?

- BOATING (DEFINITELY) **Where do you think you would have gone?**
- BOATING (PROBABLY) _____
- SOMETHING ELSE [LIST UP TO THREE LAKES]
- UNSURE

16. In general, at Pactola, would you rate the physical impacts on land or water caused by the number of boaters as:

- VERY LOW,
- MODERATELY LOW,
- CURRENTLY ACCEPTABLE,
- MODERATELY HIGH, or _____
- VERY HIGH? _____

What impacts come to mind when you say HIGH?

17. How satisfied are you with the boating facilities at Pactola?
- very satisfied, satisfied, neutral, dissatisfied, or very dissatisfied?

17a. What boating facility improvements would you like to see? _____

_____

_____

[PLEASE LIST UP TO THREE TYPES OF FACILITY IMPROVEMENTS]

18. Can you think of any management services or policy changes you would like to see that would enhance your boating experience at Pactola?

_____

_____

[PLEASE LIST UP TO THREE SERVICE OR POLICY CHANGES]

19. On that trip, did you camp at Pactola? NO YES

20. What type of campsite would you prefer to use when visiting Pactola?
- I never plan on camping here
- Undeveloped sites (no toilets or other facilities
- Semi-developed sites with pit toilets and fire rings
- Developed sites with pit toilets, picnic tables, and fire grills
- Highly developed sites with flush toilets, showers, running water, and utility hookups

21. Do you have any additional comments or recommendations for future management of Pactola?

_____

_____

That's the end of the survey – **Thank you very much for your help!**

2001 South Fork of the Snake River Boaters and Campers Visitor Survey

Boater Intercept Survey Instrument

No. _____ OMB #0596-0108

SOUTH FORK OF THE SNAKE RIVER BOATER SURVEY

Date: _____
Day: _____
Time: _____
Takeout: _____
Gender: M F
Age: _____
Parking: _____

Thank you for agreeing to complete this survey. It should take about ten minutes of your time. Your responses will provide valuable information for future river management. ***Please complete all four pages of the survey.***

1. Where is your permanent residence?

   City: _____ County: _____ State: _____

2. Is this the first time you have boated on the South Fork of the Snake River? ___ Yes ___ No

   If NO What year did you first boat on the South Fork? _____

   How many times do you boat on it in a *typical* year? _____

3. Did you hire a commercial outfitter or guide for this trip? ___ Yes ___ No

4. How long were you on the river? _____ hours **OR** _____ days _____ nights

   If more than one day, where did you camp? _____

5. How many people are in your group? _____

6. Please indicate the ***type*** and ***number of boats*** in your group on this trip.

   ____ Driftboat ____ Raft ____ Kayak/canoe ____ Jetboat/Motorboat ____ Other: _____

7. Where did you launch your boat(s)? ☐ Palisade Dam ☐ Palisade Creek ☐ Spring Creek ☐ Fullmer
   ☐ Byington ☐ Conant ☐ Other: _____

8. What was the main reason you decided to come out to the South Fork for this trip?

   _____

   _____

9. From the list of activities below, please indicate which activities you or someone in your group did during this trip. (Check *all* that apply.)

   ☐ Shore fishing ☐ Birdwatching ☐ Swimming ☐ Camping ☐ Boating ☐ Wildlife watching
   ☐ Boat fishing ☐ Photography ☐ Hiking ☐ Sightseeing ☐ Picnicking
   ☐ Cruising or just driving the boat for fun ☐ Other activities: _____

10. If more than one activity, please circle from the list above, your *primary* activity.

11. In general, how satisfied are you with this river trip?

    ☐ Very Satisfied ☐ Satisfied ☐ Neutral ☐ Dissatisfied ☐ Very Dissatisfied

If Dissatisfied or Very Dissatisfied, what factors detracted from the quality of your river trip? _____

_____

_____

_____

12. Please estimate the number of people (other than in your own group) you saw on this trip _____

13. Which of the following best describes your feelings about the number of people you saw.
- ☐ Far too many people
- ☐ Somewhat too many people
- ☐ About the right number of people
- ☐ Somewhat too few people
- ☐ Far too few people

14. In *general*, do you think there is currently a need to put a limit on the number of boats that can use this segment of the South Fork at one time?
- ☐ Definitely yes
- ☐ Probably yes
- ☐ Probably no
- ☐ Definitely no
- ☐ Don't know

IF YES Why do you feel that additional use limits are needed on the South Fork of the Snake?

_____

_____

15. If you were not able to get on this segment of the river for this trip due to restrictions on the number of boats *today*, would you have ... (Check *one* response.)

- ☐ Boated on a different segment of the South Fork? → Where? _____
- ☐ Boated on Henry's Fork?
- ☐ Boated on another part of the Snake River? → Where? _____
- ☐ Boated on Palisades Reservoir?
- ☐ Boated on a different river? →Which river? _____
- ☐ Not gone boating because there is no adequate alternative.
- ☐ Don't know.

16. Did the action of others detract from your boating enjoyment today? ☐ **YES** ☐ **NO**

IF YES What types of groups or users detracted from your enjoyment? _____

What did they do? _____

_____

Can you think of any other group that detracted from your enjoyment? _____

What did they do? _____

_____

17. To what extent is each of the following a problem on the segment of the river you floated?

	Not a Problem	A Small Problem	A Moderate Problem	A Big Problem	Don't Know
On the river ...					
Not enough camping areas	1	2	3	4	X
Too many motorized watercraft	1	2	3	4	X
Litter along the river	1	2	3	4	X
Rude, inconsiderate boaters	1	2	3	4	X
Human caused vegetation loss	1	2	3	4	X
Boating safety	1	2	3	4	X
Water pollution	1	2	3	4	X
Livestock along the river	1	2	3	4	X
Too many boaters	1	2	3	4	X
Disturbance of bald eagle nesting areas	1	2	3	4	X
Human waste or toilet paper	1	2	3	4	X
At launches or take-outs ...					
Litter or trash	1	2	3	4	X
Too many people at the launch site	1	2	3	4	X
Too many people at the take-out	1	2	3	4	X
Lack of information about the river	1	2	3	4	X
Lack of trash receptacles	1	2	3	4	X
Not enough parking	1	2	3	4	X
Lack of toilets	1	2	3	4	X
Lack of shelter/shade	1	2	3	4	X
Lack of drinking water	1	2	3	4	X
Lack of human waste disposal facility	1	2	3	4	X

18. The following is a list of possible rules available for managing the South Fork of the Snake river. For each one, please indicate your level of support or opposition for that type of rule on the South Fork in general **AND** if you think this type of rule is needed on the river now.

	Strongly Support	Support	Neutral	Oppose	Strongly Oppose	Needed Now? Yes	Maybe	No
Limit fishing access in bald eagle habitat	1	2	3	4	5	y	m	n
Assign where group may camp	1	2	3	4	5	y	m	n
Limit the number of people allowed on the river each day	1	2	3	4	5	y	m	n
Limit number of launches per day	1	2	3	4	5	y	m	n
Limit number of people per group	1	2	3	4	5	y	m	n
Limit number of boats per group	1	2	3	4	5	y	m	n
Assign launch times during heavy use times	1	2	3	4	5	y	m	n
Require people to carry out their own trash	1	2	3	4	5	y	m	n
Require people to carry out human body waste	1	2	3	4	5	y	m	n
Allow camping only at designated sites	1	2	3	4	5	y	m	n
Require use of porta-potties	1	2	3	4	5	y	m	n

19. Indicate the priority you think river managers should put on each of the following items in the future.

	Lowest Priority						Highest Priority
Protect fish habitat	1	2	3	4	5	6	7
Provide additional campsites along the river	1	2	3	4	5	6	7
More law enforcement presence	1	2	3	4	5	6	7
Provide more information about fishing quality	1	2	3	4	5	6	7
Increase river patrols	1	2	3	4	5	6	7
Protect cottonwood habitat	1	2	3	4	5	6	7
Set up a campsite reservation system	1	2	3	4	5	6	7
Provide boating etiquette information	1	2	3	4	5	6	7
Protect threatened and endangered species habitat	1	2	3	4	5	6	7
Provide river safety information signs at launches	1	2	3	4	5	6	7
Reduce crowding in heavy use areas	1	2	3	4	5	6	7
Prevent impacts to natural vegetation on shore	1	2	3	4	5	6	7
Prevent impacts to soils on shore	1	2	3	4	5	6	7
Reduce livestock grazing	1	2	3	4	5	6	7
Protect wildlife habitat	1	2	3	4	5	6	7
Provide low-impact camping information	1	2	3	4	5	6	7
Provide additional public land along the river corridor	1	2	3	4	5	6	7

20. What are your feelings about increased development activities and different types of recreation along the South Fork of the Snake River?

	Strongly Support	Support	Neutral	Oppose	Strongly Oppose	Don't Know
Residential housing along the river	1	2	3	4	5	X
Rip-rap for erosion control along the river bank	1	2	3	4	5	X
Environmental education group trips	1	2	3	4	5	X
General development along the river	1	2	3	4	5	X
Corporate training skill activities*	1	2	3	4	5	X
Outdoor leadership training courses**	1	2	3	4	5	X

***Corporate training** *refers to outdoor field trips for members of businesses and organizations designed to develop decision making and teamwork skills through activities such as climbing, ropes courses, and rafting.*

****Outdoor leadership** programs are mostly designed to train younger people in the outdoor skills necessary to lead groups into the backcountry.*

If you have any comments about your trip or river management, please feel free to use the bottom of this sheet to write those comments. Please return this questionnaire to the field researcher who passed them out.

THANK YOU FOR YOUR HELP !!

2001 South Fork of the Snake River Boaters and Campers Visitor Survey

Camper Intercept Survey Instrument

No. _____ OMB #0596-0108

SOUTH FORK OF THE SNAKE RIVER CAMPER SURVEY

Date: _____
Day: _____
Time: _____
Takeout: _____
Gender: M F
Age: _____
Parking: _____

Thank you for agreeing to complete this survey. It should take about ten minutes of your time. Your responses will provide valuable information for future river management. ***Please complete all four pages of the survey.***

1. Where is your permanent residence?

   City: _____ County: _____ State: _____

2. Is this the first time you have camped on the South Fork of the Snake River? ___ Yes ___ No

   If NO What year did you first camp on this segment of the South Fork? _____

   How many times do you camp in this area in a typical year? _____

3. Did you hire a commercial outfitter or guide for this trip? ___ Yes ___ No

4. How many people are in your group? _____

5. What is the makeup of your group? (Please check only one.)

   ☐ Individual ☐ Family ☐ Friends ☐ Family and Friends
   ☐ Group unacquainted with prior to trip ☐ Club or organization

6. Please indicate the ***type*** and ***number of boats*** in your group on this trip.

   ____ Driftboat ____ Raft ____ Kayak/canoe ____ Jetboat/Motorboat ____ Other: _____

7. Where did you launch your boat(s)? ☐ Palisade Dam ☐ Palisade Creek ☐ Spring Creek ☐ Fullmer
   ☐ Byington ☐ Conant ☐ Other: _____

8. How long did you on spend on this trip? _____ days _____ nights

   Where did you camp? Night 1: _____
   Night 2: _____
   Night 3: _____

If you camped more than one night, please refer only to your last night on the river when answering the remaining questions.

9. In general, how satisfied are you with the area where you camped?

   ☐ Very Satisfied ☐ Satisfied ☐ Neutral ☐ Dissatisfied ☐ Very Dissatisfied

   If Dissatisfied or Very Dissatisfied, what factors detracted from the quality of your campground? _____
   _____
   _____

10. Please estimate the number of people (other than own group) you saw in the area where you camped. _____

11. Which of the following best describes your feelings about the number of campers you saw.
- ☐ Far too many campers
- ☐ Somewhat too many campers
- ☐ About the right number of campers
- ☐ Somewhat too few campers
- ☐ Far too few campers

12. In *general*, do you think there is currently a need to put a limit on the number of campers that can use this camping area?
- ☐ Definitely yes
- ☐ Probably yes
- ☐ Probably no
- ☐ Definitely no
- ☐ Don't know

IF YES Why do you feel that additional use limits are needed where you camped?

_____

_____

13. If camping use limits are implemented and you were not able to get a campsite in the area where you camped on this trip, what do you think you would have done? Do you think you still would have camped somewhere else on this segment of the river or done something else? (Check just *one*.)

- ☐ Probably camped somewhere else on this segment
- ☐ Probably not camped on this segment this trip
- ☐ Probably gone to a different river or segment →**Where?** _____
- ☐ Probably not gone on a boat trip at all
- ☐ Other: _____
- ☐ Don't Know

14. The following is a list of possible rules available for reducing impacts from camping on the South Fork of the Snake river. For each one, please indicate your level of support or opposition for that type of rule to manage the camping areas on this segment **AND** if you think that type of rule is needed now.

	Strongly Support	Support	Neutral	Oppose	Strongly Oppose	Needed Now? Yes	Maybe	No
Limit on number of campers allowed per day	1	2	3	4	5	y	m	n
Limit on number of campsites occupied per day	1	2	3	4	5	y	m	n
Prohibit wood cutting	1	2	3	4	5	y	m	n
Require use of camp stoves or fire pans	1	2	3	4	5	y	m	n
Assign boaters to specific campsites	1	2	3	4	5	y	m	n
Require people to carry out their own trash	1	2	3	4	5	y	m	n
Prohibit camping in areas with rare plants	1	2	3	4	5	y	m	n
Require people to carry out human body waste	1	2	3	4	5	y	m	n
Allow camping only at designated sites	1	2	3	4	5	y	m	n
Require use of porta-potties	1	2	3	4	5	y	m	n
Prohibit camping within bald eagle closure areas	1	2	3	4	5	y	m	n

15. To what extent is each of the following a problem in the area where you camped?

	Not a Problem	A Small Problem	A Moderate Problem	A Big Problem	Don't Know
At the campground ...					
Litter or trash in campsites	1	2	3	4	X
Too many motorized watercraft	1	2	3	4	X
Campsites are too remote/secluded	1	2	3	4	X
Campsites too close to other parties	1	2	3	4	X
Not enough patrols	1	2	3	4	X
Rude, inconsiderate campers	1	2	3	4	X
Campsites damaged by previous visitors	1	2	3	4	X
Difficulty finding an unoccupied campsite	1	2	3	4	X
Too many people passed my campsite	1	2	3	4	X
Human caused erosion or bare ground	1	2	3	4	X
Human damaged trees at campsites	1	2	3	4	X
Cattle or cattle droppings in campsites	1	2	3	4	X
Human waste or toilet paper at campsites	1	2	3	4	X
Disturbance of bald eagle nesting areas	1	2	3	4	X
Vegetation loss/impacts	1	2	3	4	X
Lack of firewood	1	2	3	4	X
Noise at night	1	2	3	4	X

16. Can you think of any other problems river managers need to address concerning river camping areas?

_____

_____

17. *In general*, indicate the priority you think river managers should put on each item in the future.

	Lowest Priority						Highest Priority
Provide more undeveloped campsites	1	2	3	4	5	6	7
Provide more developed campsites	1	2	3	4	5	6	7
Protect bald eagle habitat	1	2	3	4	5	6	7
Increase river patrols	1	2	3	4	5	6	7
Protect cottonwood habitat	1	2	3	4	5	6	7
Provide more accessible campsites for the handicapped	1	2	3	4	5	6	7
Provide a campsite reservation system	1	2	3	4	5	6	7
Provide low-impact camping information	1	2	3	4	5	6	7
Provide additional campsites along the river	1	2	3	4	5	6	7
Reduce crowding in heavy use camping areas	1	2	3	4	5	6	7
Prevent impacts to natural vegetation in camping areas	1	2	3	4	5	6	7
Prevent impacts to soils in camping areas	1	2	3	4	5	6	7
Reduce livestock grazing along the river	1	2	3	4	5	6	7

18. What type of campsite would your prefer to use on the South Fork of the Snake River? (Check only *one*.)

☐ I never plan on camping on the South Fork again
☐ Undeveloped sites (no toilets or other facilities)
☐ Semi-developed sites with pit toilets and fire rings
☐ Developed sites with pit toilets, docks, picnic tables, and fire grills
☐ Highly developed sites with flush toilets, showers, running water, and electrical hookups.

19. What are your feelings about increased development activities and different types of recreation along the South Fork of the Snake River?

	Strongly Support	Support	Neutral	Oppose	Strongly Oppose	Don't Know
Residential housing along the river	1	2	3	4	5	X
Rip-rap for erosion control along the river bank	1	2	3	4	5	X
Environmental education group trips	1	2	3	4	5	X
General development along the river	1	2	3	4	5	X
Corporate training skill activities*	1	2	3	4	5	X
Outdoor leadership training courses**	1	2	3	4	5	X

**Corporate training* *refers to outdoor field trips for members of businesses and organizations designed to develop decision making and teamwork skills through activities such as climbing, ropes courses, and rafting.*
***Outdoor leadership* *programs are mostly designed to train younger people in the outdoor skills necessary to lead groups into the backcountry.*

If you have any comments about your camping area or river management, please feel free to use the bottom of this sheet to write those comments. Please return this questionnaire to the field researcher who passed them out.

THANK YOU FOR YOUR HELP !!

2001 Utah River Study

Intercept Survey Instrument

OMB #0596-0108

No._____

Date: _____
Segment: _____
Gender: M F
Age: 15-20 21-30
31-40 41-50
51-60 61-70
Over 70

UTAH STATE UNIVERSITY ON-SITE RIVERS SURVEY

Thank you for agreeing to complete this survey. It should take about five minutes of your time. Your responses will provide valuable information for future river management.
Please complete both sides of the survey.

1. We would like to know where your permanent residence is.
   City: _____ State: ____ Country: _____
2. Is this the first time you have run this particular river segment? ___ Yes ___ No
3. Is this the first time you have run a Utah river? ___ Yes ___ No
4. If No to question 3, how many previous times have you run a Utah river? _____
5. Are you part of a commercial or private group? _____ commercial _____ private
6. How many people were in your group? _____
7. How long have you been on this river this trip? _____ hours **OR** _____ days _____ nights
   If more than one day, where did you camp _____
8. In general, how satisfied were you with the trip?
   □ Very Satisfied □ Satisfied □ Neutral □ Dissatisfied □ Very Dissatisfied
9. What factors do you feel added to or detracted from the quality of your river trip? _____
   _____
   _____
   _____
10. Please estimate the number of watercraft (other than your own party's) you saw on this river trip. _____
11. Which of the following best describes your feelings about the number of watercraft you saw?
    _____ Far too many watercraft
    _____ Somewhat too many watercraft
    _____ About the right number of watercraft
    _____ Somewhat too few watercraft
    _____ Far too few watercraft
12. Please estimate the number of people (other than your own group) you saw on this river trip. _____
13. Which of the following best describes your feelings about the number of people you saw?
    _____ Far too many people
    _____ Somewhat too many people
    _____ About the right number of people
    _____ Somewhat too few people
    _____ Far too few people

14. In your opinion, how would you rate the amount of physical impacts from *river running recreation* you saw.

_____ Extremely low
_____ Moderately low
_____ Currently acceptable
_____ Moderately high
_____ Extremely high

15. Please estimate your total expenditures for this river trip up to now. $ _____

16. What percent of that amount was spent *in Utah*? _____ %

17. What percent of that amount was spent *outside Utah*? _____ %

18. These expenditures are for _____ people.

For Non-Utah Residents Only:

19. When not on the river, are you staying overnight in Utah? □ No □ Yes ⟶ How many nights? _____

For Both Utah and Non-Utah Residents:

Also, we are conducting this survey to develop a list of river boaters that we will select from to receive a mail survey. The purpose of the survey is to develop a river management plan. If you would not mind being part of this mail survey, please fill out your name and address in the space provided below. ***This information is confidential and will only be used for purposes of this research.***

Name: _____

Street Address: _____

City: _____ State: _____ Zip: _____

If you have any comments about your trip or river management, please feel free to use the bottom of this sheet to write those comments. Please return this questionnaire to the field researcher who passed them out.

THANK YOU FOR YOUR HELP !!

2001 Utah River Study

Mail Survey Instrument

No. _____ OMB #0596-0108

UTAH RIVER TRIP SURVEY

Thank you for taking time to complete this survey!

PART I: RIVER RUNNING EXPERIENCE

By "river running," we mean taking a trip of any length on a river in a canoe, raft, kayak, or dory (drift boat) or other non-motorized or small-motor watercraft during 1999. This trip could be in a personal craft, a friend's craft, or as part of a commercial guided river trip. A *commercial trip* means a private company or agency owns the watercraft and there is a professional guide leading the trip.

NOTE: If you take all your trips on Utah rivers, your responses in both columns should be the same.

	In General	On Utah Rivers
1. In what *year* did you first run a river?		
2. During the *past 12 months*, how many times did you run rivers?		
3. About how many river trips have you been on in your life? **NOTE: If you have only been on one or two river trips in your life, check here ❒ and go to Question 11.**		
4. How many times do you run rivers in a *typical year*?		
5. How many *river miles* is an average float for you?		
6. How many *days* is a usual float for you?		
7. How many *watercraft* are in your average group?		
8. How many *people* are in your average group?		
9. Do you usually go as part of a (1) private group or (2) commercial group? [Enter a 1 or 2 in boxes.]		
10. What is the *usual makeup* of your group? [(1) = Individual, (2) = Family,(3) = Friends, (4) = Family *and* friends, (5) = Group unacquainted with prior to trip, (6) = Club or organization.]		

11. How would you rate your skill level as a river runner? (check *one*)

☐ Beginner ☐ Intermediate ☐ Advanced ☐ Expert

12. In general, how often do you obtain information about river running from each of the sources listed below? (Please circle a response *for each*)

INFORMATION SOURCE	Never	Rarely	Some-times	Often	Very Often
A. River running groups or clubs	1	2	3	4	5
B. Other outdoor groups or clubs	1	2	3	4	5
C. Friends/family	1	2	3	4	5
D. Radio/television	1	2	3	4	5
E. Outdoor equipment stores	1	2	3	4	5
F. Magazine or Newspaper	1	2	3	4	5
G. Government agency offices/personnel	1	2	3	4	5
H. Guidebook	1	2	3	4	5
I. Advertisement	1	2	3	4	5
J. Tour guide	1	2	3	4	5
K. Websites (please specify) _____	1	2	3	4	5
L. Other (please specify) _____	1	2	3	4	5

13. Are you a member of any river running groups or clubs?

☐ NO ☐ YES ------> If yes, which ones? _____

_____

14. Are you a member of any environmental or conservation organizations such as Sierra Club, Nature Conservancy, or Ducks Unlimited?

☐ NO ☐ YES ------> If yes, which ones? _____

_____

PART II: YOUR RIVER RUNNING TRIP EXPERIENCE

NOTE: All remaining questions refer to the specific river trip indicated on the cover letter. Please verify the segment you floated on that day below. If you have taken other Utah river running trips, please consider only this one trip while answering these questions

Date: _____

River: ☐ Green ☐ Colorado ☐ Dolores ☐ White ☐ San Juan

River segment (see map on inside of front cover):

Green	Colorado	Dolores	White	San Juan
☐ Browns Park	☐ Westwater	☐ Gateway	☐ Rangely to Bonanza	☐ Upper
☐ Desolation	☐ Daily		☐ Bonanza to Enron	☐ Lower
☐ Daily				☐ Both
☐ Labyrinth				

Type of trip: ☐ commercial or ☐ private float trip?

15. What type of watercraft did you use?
☐ Canoe ☐ Kayak ☐ Raft ☐ Dory (drift boat) ☐ Sail boat/board
☐ Jet ski ☐ Small-motor craft ☐ Other _____

16. How many people, including yourself, traveled together for this trip?

Number of adults (18 and over) _____ Number of children _____

17. How many times have you floated this segment of river before? _____

18. What type of group or groups were part of your river party? (check all that apply)

____ Family
____ Friends/acquaintances
____ Group unacquainted prior to trip
____ Club or organization (Please give type) _____

19. When you made the decision to float this segment, did you consider some other river or segment you might float instead?

☐ No ☐ Yes → If yes, which river or segment?
_____
☐ Sorry, don't remember the segment name.

Why did you finally decide on this segment?

_____

_____

20. Below are some statements that many people consider important reasons for taking a river float trip. Please think back to when you decided to take your float trip. Then indicate how important *each* of the reasons seemed to be at that time (circle 1 number for each reason).

Trip reasons:	Not at all Important	Slightly Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
To do something new and different	1	2	3	4	5	6
Be in a natural area	1	2	3	4	5	6
Run rapids	1	2	3	4	5	6
See spectacular scenery	1	2	3	4	5	6
For the exercise	1	2	3	4	5	6
To feel secluded	1	2	3	4	5	6
It was close to home	1	2	3	4	5	6
Others in my group wanted to do it	1	2	3	4	5	6
See wildlife	1	2	3	4	5	6
Be with family and friends	1	2	3	4	5	6
I thought the river conditions would be good	1	2	3	4	5	6
To learn about nature	1	2	3	4	5	6
To get away from it all	1	2	3	4	5	6
To run the river in high water	1	2	3	4	5	6
To run a familiar river segment	1	2	3	4	5	6
To meet other people	1	2	3	4	5	6
Improve my boating skills	1	2	3	4	5	6
Use outdoor skills	1	2	3	4	5	6
Visit historic and archeological sites	1	2	3	4	5	6
To enjoy quiet and tranquility	1	2	3	4	5	6
To catch a lot of fish	1	2	3	4	5	6
Catch large fish	1	2	3	4	5	6
To be able to hike up side canyons	1	2	3	4	5	6
To see unfamiliar landscapes	1	2	3	4	5	6
Have some exciting unplanned experiences	1	2	3	4	5	6
To do an impressive sort of thing	1	2	3	4	5	6
For a challenge	1	2	3	4	5	6
To have a lot of thrills	1	2	3	4	5	6
To get away from the crowds	1	2	3	4	5	6
To see new and different areas	1	2	3	4	5	6
To feel in control of the boat	1	2	3	4	5	6
To show others you can do it	1	2	3	4	5	6
It was an organized trip or group outing	1	2	3	4	5	6
To experience remote areas	1	2	3	4	5	6
To think about my personal values	1	2	3	4	5	6
Learn about human history and culture	1	2	3	4	5	6
Practice my fishing skills	1	2	3	4	5	6
For a sense of personal accomplishment	1	2	3	4	5	6
To get a good workout	1	2	3	4	5	6
Be with others who have similar interests	1	2	3	4	5	6
To experience solitude	1	2	3	4	5	6
To do something new and different	1	2	3	4	5	6
To tell others about it at home	1	2	3	4	5	6

21. In general, how satisfied were you with this river trip? (Please circle one number)

1. Very Satisfied
2. Satisfied
3. Neither satisfied or dissatisfied
4. Dissatisfied
5. Very dissatisfied

22. What did you enjoy the most?

_____

_____

23. What did you enjoy the least?

_____

_____

24. To what extent do you feel the river trip actually provided each of the following experiences?

Experiences:	**Not part of the trip**				**Major part of the trip**
It was exciting	1	2	3	4	5
I got some exercise	1	2	3	4	5
It was something to be proud of	1	2	3	4	5
I felt close to nature	1	2	3	4	5
I experienced solitude	1	2	3	4	5
It was relaxing	1	2	3	4	5
It was a wilderness experience	1	2	3	4	5
I felt close to my friends/family	1	2	3	4	5
It was a challenge	1	2	3	4	5
I caught fish	1	2	3	4	5
I thought about my personal values	1	2	3	4	5
I met friendly people	1	2	3	4	5
I learned about history and culture	1	2	3	4	5
I practiced my outdoor skills	1	2	3	4	5
It was an impressive thing to do	1	2	3	4	5
I learned about the natural world	1	2	3	4	5
It was a unique experience	1	2	3	4	5

PART III: RIVER MANAGEMENT PREFERENCES

NOTE: Remember, all remaining questions refer to the specific river trip in which you were contacted by a Utah State University research technician at the river takeout.

25. Briefly read the following list. Then go back and indicate the priority you think river mangers should put on each item in the future.

	Lowest Priority						**Highest Priority**
Provide toilets at river put-ins and take-outs	1	2	3	4	5	6	7
Increase parking spaces at put-ins and take-outs	1	2	3	4	5	6	7
Provide picnic areas along river	1	2	3	4	5	6	7
Provide trash receptacles at take-outs	1	2	3	4	5	6	7
Achieve better spacing among groups on the river by assigning time of day when each group may begin its trip	1	2	3	4	5	6	7
Provide cleaner toilets	1	2	3	4	5	6	7
Provide river running safety information at put-ins	1	2	3	4	5	6	7
Provide river trip information signs at put-ins	1	2	3	4	5	6	7
Increase number of daily launch permits	1	2	3	4	5	6	7
Provide information about rivers' natural and cultural history	1	2	3	4	5	6	7
Reduce number of daily launch permits	1	2	3	4	5	6	7
Reduce crowding along heavy use areas	1	2	3	4	5	6	7
Prevent impacts to natural vegetation on shore	1	2	3	4	5	6	7
Prevent impacts to soils on shore	1	2	3	4	5	6	7
Provide separate outfitter and private take-outs to reduce congestion	1	2	3	4	5	6	7
Protect wildlife	1	2	3	4	5	6	7
Protect historical/cultural resources and artifacts	1	2	3	4	5	6	7
Provide additional campsites along rivers	1	2	3	4	5	6	7
Provide more river rangers to patrol rivers	1	2	3	4	5	6	7
Provide information on how floaters can reduce plant and soil impacts	1	2	3	4	5	6	7
Control non-native vegetation on shore	1	2	3	4	5	6	7
Provide boating etiquette information	1	2	3	4	5	6	7
Better campsite reservation system	1	2	3	4	5	6	7
Provide more disabled access facilities	1	2	3	4	5	6	7

26. In general, I would rate the physical impacts caused by the number of people who float this river as ... (Check *one*)

- ☐ Extremely low
- ☐ Moderately low
- ☐ Currently acceptable
- ☐ Moderately high
- ☐ Extremely high

27. Some Utah river segments have different rules regarding boat use. Some have very few use rules and others have several. For each of the following types of rules, please indicate if you think it is or is not a rule on the river segment that you floated. If it is a rule, please indicate your level of support or opposition to that type of rule for that segment.

	Don't Know	No	Yes (if yes)		Strongly Support	Support	Oppose	Strongly Oppose
Limit on number of trips allowed per day	☐	☐	☐	→	1	2	3	4
Limit on number of people per group	☐	☐	☐	→	1	2	3	4
Limit on number of boats per group	☐	☐	☐	→	1	2	3	4
Require firepans	☐	☐	☐	→	1	2	3	4
Prohibit pets on the river	☐	☐	☐	→	1	2	3	4
Require people to carry out their trash	☐	☐	☐	→	1	2	3	4
Require people to carry out human body waste	☐	☐	☐	→	1	2	3	4
Prohibit beach fires along the river	☐	☐	☐	→	1	2	3	4
Allow camping only at designated sites	☐	☐	☐	→	1	2	3	4
Each group is assigned where they may camp	☐	☐	☐	→	1	2	3	4
Other _____	☐	☐	☐	→	1	2	3	4

28. Some people like to see other people on the river and some do not. Which of the following best describes your feelings about the total number of people you saw while you were on the river?

☐ Far too many
☐ Too many → Go to question 28a

☐ About the right number
☐ Too few
☐ Far too few → Go to question 29

28a. If you feel there were "too many" people on the river during your trip, do you think that there should have been a restriction on the number of people that could use the river at the time of your trip?

☐ Unsure
☐ Definitely no
☐ Probably no → Go to question 29

☐ Probably yes
☐ Definitely yes → If yes, why do you think there should be use restrictions?

_____
_____

29. What do you feel would be an acceptable number of people and parties to see on the river per day? If it does not make any difference to you, regarding the number of people or parties (groups) you see, place an "X" in the space provided.

_____ Acceptable number of people.

_____ Acceptable number of parties.

30. If you had not been able to get a permit or guide to float this river segment, do you think you would have gone boating on another segment at the time of your trip, or done something else? (Check *one*)

- ☐ Definitely float another river segment
- ☐ Probably float another river segment
- ☐ Something else
- ☐ Unsure

31. With respect to providing visitor services or land and river protection on the river you floated, how should managers focus their efforts? (Check *one*)

- ☐ Much more focus on visitor services
- ☐ More focus on visitor services
- ☐ An even mix of protection and providing visitor services
- ☐ More focus on protection of the land and river area
- ☐ Much more focus on protection of the land and river area

32. To what extent is each of the following a problem on the segment of river you floated?

On the river...	Don't Know	Not a Problem	A Small Problem	A Moderate Problem	A Big Problem
Mosquitos/insects	X	1	2	3	4
Too many campfire rings	X	1	2	3	4
Too many motorized watercraft	X	1	2	3	4
Not enough rapids	X	1	2	3	4
Too remote or secluded	X	1	2	3	4
Human caused vegetation loss	X	1	2	3	4
Litter along river	X	1	2	3	4
Not enough visitor facilities and services	X	1	2	3	4
Conflicts between river runners & motorboaters	X	1	2	3	4
Too many dangerous rapids	X	1	2	3	4
Destruction/defacing of historic resources	X	1	2	3	4
Soil erosion or trampling on shore	X	1	2	3	4
Graffiti or other vandalism	X	1	2	3	4
Too many people	X	1	2	3	4
Evidence of cattle	X	1	2	3	4
Lack of toilets	X	1	2	3	4
Amount of time in sight or sound of other parties	X	1	2	3	4
Inexperienced boaters on the river	X	1	2	3	4
Large groups of boaters	X	1	2	3	4
Time delays at rapids	X	1	2	3	4
Poor fishing	X	1	2	3	4
Too many river runners	X	1	2	3	4
Too dangerous	X	1	2	3	4
Jet ski encounters	X	1	2	3	4
Not enough campsites	X	1	2	3	4
Low flying aircraft	X	1	2	3	4

32. (cont.) To what extent was each of the following a problem on the segment of river you floated?

	Don't Know	Not a Problem	A Small Problem	A Moderate Problem	A Big Problem
On the river...					
Conflicts between different groups of boaters	X	1	2	3	4
Inexperienced boaters	X	1	2	3	4
Rude, inconsiderate boaters	X	1	2	3	4
Noise	X	1	2	3	4
Boating safety	X	1	2	3	4
Water pollution	X	1	2	3	4
Too many boats on the river	X	1	2	3	4
At launches or take-outs...					
Litter or trash	X	1	2	3	4
Too many people at the launch site	X	1	2	3	4
Too many people at the takeout	X	1	2	3	4
Lack of information about the river	X	1	2	3	4
Lack of trash receptacles	X	1	2	3	4
Not enough parking	X	1	2	3	4
Lack of toilets	X	1	2	3	4
Lack of shelter/shade	X	1	2	3	4
Lack of water	X	1	2	3	4
Vegetation & soil trampling	X	1	2	3	4

NOTE: If you did not camp along the river, check here ☐ and go to question 33.

Litter or trash in campsites	X	1	2	3	4
Campsites are too remote/secluded	X	1	2	3	4
Campsites too close to other parties	X	1	2	3	4
Campsites damaged by previous visitors	X	1	2	3	4
Difficulty finding an unoccupied campsite	X	1	2	3	4
Too many groups passed my campsites	X	1	2	3	4
Human caused erosion or bare ground at campsites	X	1	2	3	4
Human damaged trees at campsites	X	1	2	3	4
Human waste at campsites	X	1	2	3	4
Cattle droppings in campsites	X	1	2	3	4

33. Can you think of any other problems river managers need to address along the river segment you ran?

_____

_____

_____

34. From the list of problems on question 32, please go back and *circle the three or four most important problems* you feel that river managers need to address.

35. What type of riverside campsite would you prefer to use on the river you floated? (Check *one*)

- ☐ I never plan on camping along Utah rivers
- ☐ Undeveloped sites (no toilets or other facilities)
- ☐ Semi-developed sites with pit toilets and fire rings
- ☐ Developed sites with pit toilets, parking, picnic tables, and fire grills
- ☐ Highly developed sites with flush toilets, showers, running water, and utility hookups

36. If you are a private boater, would you be willing to pay a fee on that river segment?

- ☐ Yes
- ☐ No
- ☐ Not a private boater

37. Please indicate if you would oppose, favor, or feel neutral towards *each* of the following methods to raise additional funds from private, noncommercial boaters for river management on the river segment you floated.

	Strongly Oppose	Oppose	Neutral	Favor	Strongly Favor
A. Daily use fee for river segment permit	☐	☐	☐	☐	☐
B. Weekly use fee for river segment permit	☐	☐	☐	☐	☐
C. Per trip fee (for multi-day trips)	☐	☐	☐	☐	☐
D. Annual use fee for river segment permit	☐	☐	☐	☐	☐
E. Utah state tax on sale on new river running boats and equipment	☐	☐	☐	☐	☐
F. Weekly permit for <u>all</u> dispersed recreation users in non-fee areas (including hiking, biking, camping, four-wheeling, river running, etc.)	☐	☐	☐	☐	☐
G. Annual permit for <u>all</u> dispersed recreation users in non-fee areas (including hiking, biking, camping, four-wheeling, river running, etc.)	☐	☐	☐	☐	☐
H. Other _____	☐	☐	☐	☐	☐

38. Which would be your <u>preferred</u> method? (Circle *one*) A B C D E F G H

PART IV: TRIP CHARACTERISTICS

☆ *All of the river segments included in this study are located in eastern Utah (Daggett, Uintah, Carbon, Emery, Grand, and San Juan counties). The following questions are for* ***VISITORS to eastern Utah only****. If you are a resident of Daggett, Uintah, Cargon, Emery, Grand, or San Juan county,* ***check here*** ☐ *and skip to question #44.*

Once again, for each of the following questions, refer to the river running trip to Utah when you were contacted by a USU research technician at the takeout.

39. How long did you stay *in eastern Utah* during your trip? _____ days _____ nights
Did you stay overnight when <u>not</u> on the river? ☐ Yes ☐ No

If *yes*, how many nights did you spend in each of the following ...
_____ Hotel/Motel _____ Government campground _____ Private campground
_____ Non-designated campground _____ Family/Friend _____ Second home

40. Check all of the following activities you participated in during your trip to eastern Utah.

☐ Camping	☐ Mountain Climbing	☐ Backpacking
☐ Photography	☐ Four-wheeling	☐ Visit Native American Sites
☐ Motor boating	☐ Hang gliding	☐ Fishing
☐ Downhill Skiing	☐ Rock Climbing	☐ Hunting
☐ Ski touring	☐ Driving for Pleasure	☐ Tennis
☐ Picnicking	☐ Canoeing/kayaking	☐ Golf
☐ Bird watching	☐ Hiking	☐ Mountain biking
☐ Rafting	☐ ATV riding	☐ Dirt biking

41. Was eastern Utah the primary destination for your trip, or was it just one stop on your trip?

☐ Primary destination ☐ Just one stop. What was your primary destination?
_____

42. What was the *primary* reason that you visited eastern Utah? (Please just check *one*)
☐ Go river running ------> Any specific rivers or areas? _____
☐ For other outdoor activities (mountain biking, hiking, camping, four-wheeling, etc.)
☐ Visit National Parks
☐ General touring, sightseeing
☐ Visit family or friends
☐ Business
☐ Other (please specify): _____

43. How did you find out about eastern Utah as a destination for river running?

☐ River running groups or clubs	☐ Government agency offices/personnel
☐ Other outdoor groups or clubs	☐ Guidebook
☐ Friends/Family	☐ Advertisement
☐ Radio/Television	☐ Tour guide
☐ Outdoor equipment store	☐ Websites (please specify)_____
☐ Magazine or Newspaper	☐ Other (please specify) _____

PART V: BACKGROUND INFORMATION

44. What is your sex? ☐ male ☐ female

45. What is your age? _____

46. What is your race or ethnic background?
- ☐ Black/African American
- ☐ American Indian
- ☐ Asian
- ☐ Hispanic
- ☐ White/Anglo/Caucasian
- ☐ Other _____

47. How many years of school have you completed?
- ☐ Less than high school degree
- ☐ Completed high school
- ☐ Some college or technical school
- ☐ Associate or technical college degree
- ☐ Completed bachelor's degree
- ☐ Some post graduate work
- ☐ Completed a post graduate degree
- ☐ Other (please specify) _____

48. Which of the following best describes the area where you currently live?
- ☐ A large metropolitan city (over 1,000,000 population) or suburb
- ☐ A metropolitan city (250,000 to 1,000,000) or suburb
- ☐ A major city (100,000 to 250,000) or suburb
- ☐ A medium sized city (25,000 to 100,000) or suburb of a medium sized city
- ☐ A small city (5,000 to 25,000) or suburb of a small city
- ☐ A town or village (2,500 to 5,000)
- ☐ In the country or a very small town (under 2,500)
- ☐ Rural farm or ranch

49. Which of the following best describes the area where you have lived most of your life?
- ☐ A large metropolitan city (over 1,000,000 population) or suburb
- ☐ A metropolitan city (250,000 to 1,000,000) or suburb
- ☐ A major city (100,000 to 250,000) or suburb
- ☐ A medium sized city (25,000 to 100,000) or suburb of a medium sized city
- ☐ A small city (5,000 to 25,000) or suburb of a small city
- ☐ A town or village (2,500 to 5,000)
- ☐ In the country or a very small town (under 2,500)
- ☐ Rural farm or ranch

50. What is your current employment status?
- ☐ Working full time
- ☐ Working part time
- ☐ Currently unemployed
- ☐ Retired
- ☐ Student
- ☐ Homemaker
- ☐ Never been employed
- ☐ Other (please specify) _____

51. What is your usual occupation/job? (If retired or unemployed, tell us your previous occupation.)

JOB TITLE _____

TYPE OF WORK _____

52. What was your total household income (including all family members) before taxes for 1998.
- ☐ Under $10,000
- ☐ $10,000 to $19,999
- ☐ $20,000 to $29,999
- ☐ $30,000 to $39,999
- ☐ $40,000 to $49,999
- ☐ $50,000 to $59,999
- ☐ $60,000 to $69,999
- ☐ $70,000 to $79,999
- ☐ $80,000 to $89,999
- ☐ $90,000 to $99,999
- ☐ $100,000 to $109,999
- ☐ $110,000 or more

53. How many people depend upon this income? _____ Adults _____ Children (18 or under)

Please feel free to make any additional comments on the inside of the back cover. When you have completed the survey, ***please staple or tape the survey closed and mail****. Our return address and postage are printed on the back of the booklet. If you would like to receive a short summary of the study results, check here* ☐

Thank you for your assistance!

2004 Front Country Visitor Study for the Grand Staircase-Escalante National Monument

Monument Site Intercept Survey Instrument

GRAND STAIRCASE-ESCALANTE NATIONAL MONUMENT

VISITOR SURVEY

Hello! I'm from Utah State University and we're conducting a survey of visitors to this area. If you are willing, I would like to ask you some questions about your visit. The information that you provide will only be used for the purposes of this research. All of your responses will be kept strictly confidential and will be very helpful in improving visitor services here in the future.

Would you be willing to participate in this survey?

❑ Yes ❑ No [record refusal on refusal sheet provided]

ID#_____ **INTERVIEWER:**_____

DATE:_____/_____/_____ **DAY:**_____

TIME:_____ **LOCATION:**_____

GENDER:
❑ Male ❑ Female

PARKING AREA CONDITION:
❑ < 1/4 full ❑ 1/4-1/2 full ❑ 1/2-3/4 full
❑ full ❑ over capacity

OMB # 0596-0108

# of visitors missed while administering this survey _____

1. Have you heard of the Grand Staircase-Escalante National Monument? ❑ Yes ❑ No ❑ Unsure
[If No, skip to question #4]

1a. Do you know which agency manages this National Monument? ❑ Yes ❑ No ❑ Unsure

1b. If Yes, which agency is this? _____

2. How did you **first** find out about the Monument? **[only check ONE answer]**

- ❑ Friends/Family
- ❑ Driving By/Road Signs
- ❑ Maps/Brochures
- ❑ Magazine
- ❑ Newspaper
- ❑ Guidebook
- ❑ Internet
- ❑ Visitor Center
- ❑ Clinton Designation
- ❑ Other_____

3. Where did you get information about the Monument **for this particular trip**?

- ❑ Friends/Family
- ❑ Driving By/Road Signs
- ❑ Maps/Brochures
- ❑ Magazine
- ❑ Newspaper
- ❑ Other_____
- ❑ Guidebook
- ❑ Internet
- ❑ Visitor Center
- ❑ Government agency office/personnel
- ❑ Previous Trip/Experience

[Check all that apply; probe "Is there any other source of information for this trip?]

The rest of the questions in this survey refer to the "Monument area" – by that we mean [show map if needed] the area within the Monument boundaries, as well as the communities surrounding the Monument.

4. Is this your first time visiting the Monument area?

❑ Yes ❑ No **[If No, go to Question 4b]**

4a. If Yes, In general, what did you expect to see and experience during your visit to the Monument area?_____

_____

[skip to question 5]

4b. If No, in what year did you first visit the Monument area? _____

[If first visit was after 1996, skip to question 4d]

4c. This area was designated a National Monument in 1996. Would you say your visits have increased, decreased, or stayed the same since the designation?

❑ increased ❑ decreased ❑ stayed the same

4d. About how many times do you visit the Monument area in a typical year?

❑ once a year ❑ twice a year ❑ three times a year ❑ > three times a year
❑ every other year ❑ every couple of years ❑ hardly ever

5. How long do you intend to stay in the Monument area?

_____ Day(s) **or** _____ Hours

6. In general, what is your overall impression of the National Monument_____

_____

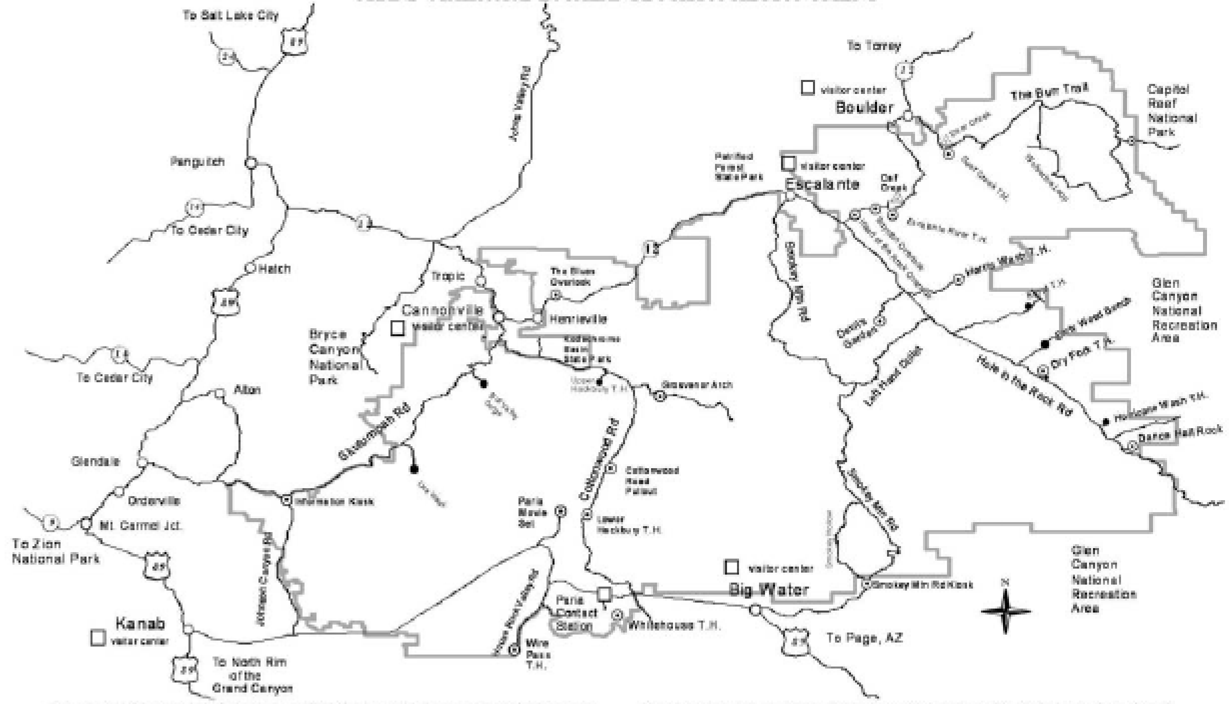
_____

_____

_____

CONTINUE INTERVIEW WITH THE MAPPING EXERCISE ON THE NEXT PAGE.

GRAND STAIRCASE-ESCALANTE NATIONAL MONUMENT



Next, we would like to get an idea of your trip route while visiting the Grand Staircase-Escalante National Monument. Here is a map of the Monument area.

1) Could you please show me the highway you used to enter the map area? **[indicate by writing enter]**

2) Please show me the route you took and the places you stopped within the map area up until this point in your trip. **[Trace the trip route and circle and number the stops]**

3)Did you stop at any visitor centers along the way? **[place a check mark in the box next to each visitor center they stopped at]**

4) Could you please show me where you are planning to go and where you might stop for the rest of your trip to the Monument area? **[indicate this route with a dotted line and only circle the places where they may stop]**

5) What highway are you planning on taking to leave the map area **[indicate by writing exit]**

6) Lastly, where do you plan to go once you leave the map area? ______________________

7. Would you be willing to receive and complete a more detailed mail-back survey about your Monument visit at a later date? ❑ Yes ❑ No

7a. If Yes, What is your name and mailing address?

Name _____

Mailing Address _____

_____

_____
Zip Code

This last section of the survey is for you to complete on your own.
If you have any questions or need any help, please feel free to ask.
When finished please return the survey to the researcher.

8. Where are you from? City:_____

State:_____ **If in Utah,** County _____

Zip:_____ Country _____

9. Why are you visiting the Monument area?

❑ Primarily for recreation – the Monument is your main destination

❑ Primarily for recreation – but your main destination is NOT the Monument

9a. What is your main destination? _____

❑ Primarily for business, family, or other reasons; the Monument was a side trip

❑ Other_____

10. In general, how satisfied are you with your trip to the Monument so far?

6	5	4	3	2	1
Very Satisfied	Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Dissatisfied	Very Dissatisfied

10a. Why? _____

_____

11. How satisfied have you been with the visitor services in the surrounding communities?

6	5	4	3	2	1
Very Satisfied	Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Dissatisfied	Very Dissatisfied

11a. Why? _____

_____

❑ Did not stop in any of the surrounding communities

Please answer the following questions (12a - 12l) for the recreation site you are at right now.

12a. Have you visited this site before? ❑ Yes ❑ No

12b. What recreation activities did you do while at this site? **[Check all that apply]**

❑ Hiking	❑ Photography	❑ Canyoneering
❑ Camping	❑ Visiting historic sites	❑ Fishing
❑ Scenic driving	❑ Viewing plants/animals	❑ Horseback riding
❑ Exploring slot canyons	❑ Viewing natural features	❑ Bicycle riding
❑ Picnicking	❑ Viewing rocks	❑ Motorcycle/dirt bike riding
❑ Nature hike (less than ¼ mile)	❑ Wildlife viewing	❑ 4x4/ATV driving
❑ Nature hike (¼ mile to 1 mile)	❑ Rock climbing	❑ Family reunion
❑ Nature hike (more than 1 mile)	❑ Other Activity _____	

12c. What did you expect to experience when you visited this site? _____

_____

12d. To what extent were your expectations met? Would you say the area was:

- ❑ much better than you expected?
- ❑ better than you expected?
- ❑ about the same as you expected?
- ❑ worse than you expected?
- ❑ much worse than you expected?

12e. In what ways was it better or worse than you expected?

_____

_____

12f. Please estimate the number of people (other than in your own group) you saw while here? _____

12g. Was this number of people…

❑ more than you expected ❑ about the same as you expected ❑ less than you expected

12h. Which of the following best describes your feelings about the number of people you saw here?

5	4	3	2	1
Far too many people	Somewhat too many people	About the right number of people	Somewhat too few people	Far too few people

12i. What effect do you feel the number of people you saw had on your overall experience at this site?

❑ added to my experience ❑ had no effect on my experience ❑ detracted from my experience

12j. If you chose "detracted from", Why do you think it detracted from your experience?

_____

_____

12k. Do you think the number of people allowed to visit this site at any one time should be restricted to a lower number of visitors than you saw today? ❑ Yes ❑ No

12l. Why is that?_____

_____

14. How many people are in your group? _____ people

15. How many people are in your vehicle? _____people

16. What year were you born? _____

17. That is all the questions. Do you have any other comments you would like to share with management about the Grand Staircase-Escalante National Monument or surrounding area?

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Thank you very much for your time and enjoy the rest of your trip.

2004 Front Country Visitor Study for the Grand Staircase-Escalante National Monument

Mail Survey Instrument

GRAND STAIRCASE-ESCALANTE NATIONAL MONUMENT

VISITOR MAIL SURVEY

OMB # 0596-0108 ID # _____

You were contacted by a Utah State University researcher on _____/_____/_____
Please answer all of the following questions with that particular trip in mind.

1. In general, how satisfied were you with your trip to the Monument?

6	5	4	3	2	1
Very Satisfied	Satisfied	Somewhat Satisfied	Somewhat Dissatisfied	Dissatisfied	Very Dissatisfied

2. What things did you like or dislike about the Monument? _____

_____

_____

3. Were any of the areas in the Monument you visited different from what you had expected? ❑ Yes ❑ No

3a. If Yes, what area(s) were different and how were they different from what you had expected?

Name of Area	How was the area different from what you had expected?

4. People can gain many benefits from a recreation trip to the Monument. Please tell us how important each of the following potential benefits is to you personally when you visit the Monument.

	Most Important	Important	Slightly Important	Not Important
Escape from pressures of ordinary life	4	3	2	1
Do something new and different	4	3	2	1
Be in natural area	4	3	2	1
Exercise	4	3	2	1
Discover new places & landscapes	4	3	2	1
Learning more about nature	4	3	2	1
Use outdoor skills	4	3	2	1
Enjoy quiet and tranquility	4	3	2	1
For a challenge	4	3	2	1
For a sense of personal accomplishment	4	3	2	1
To tell others about it at home	4	3	2	1
Being creative (painting, taking photos, etc.)	4	3	2	1
Finding solitude	4	3	2	1
Being with friends and/or family	4	3	2	1
Meet new people/socialize	4	3	2	1
Not having to see people outside my group	4	3	2	1
Seeing a place I've never seen before	4	3	2	1
Viewing the scenery	4	3	2	1

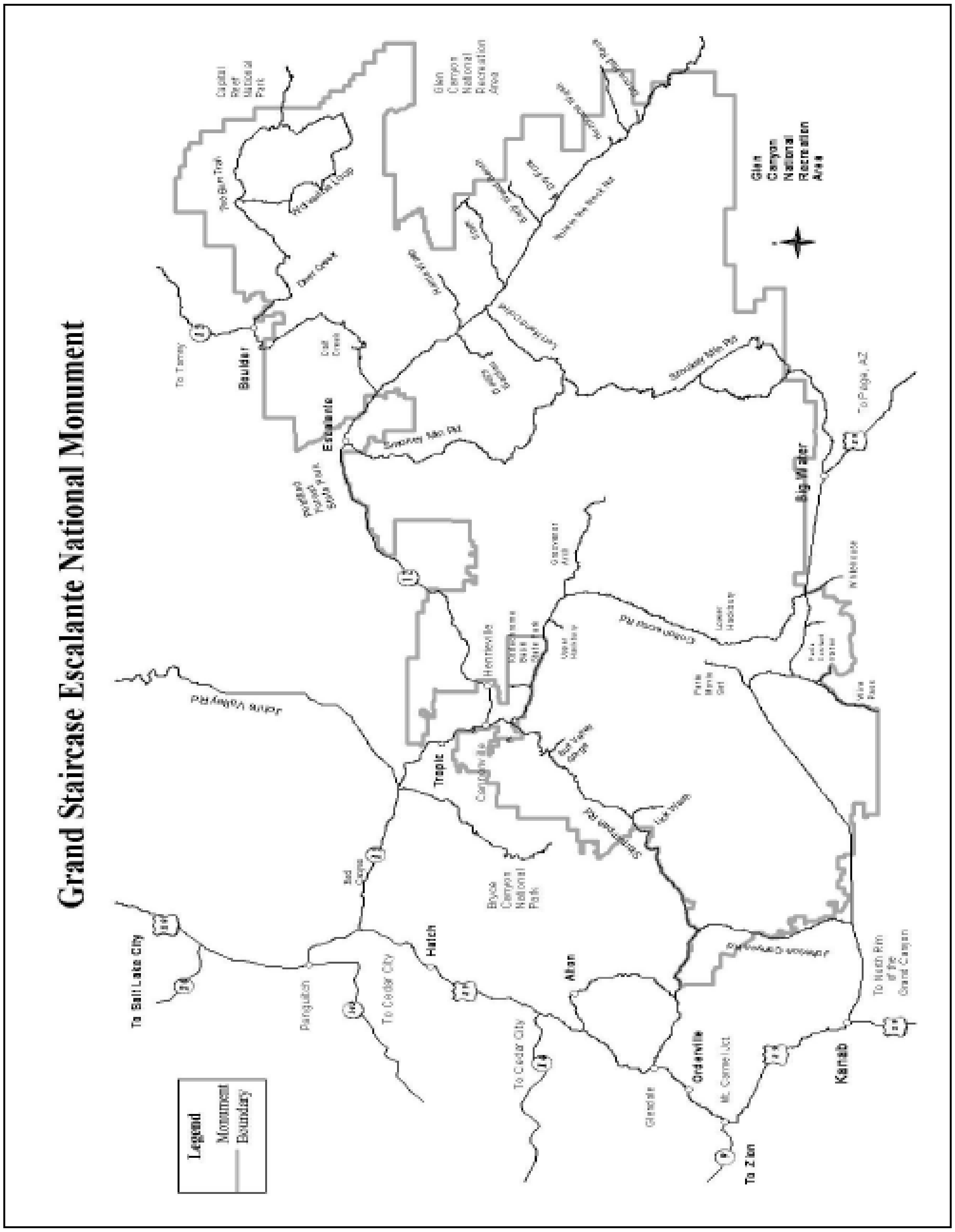
5. If you stayed overnight while visiting the Monument, where did you stay? **[You may choose more than one answer]**

# of nights		**Identify the Site, Location, or Property below**
_____	Camped in an **undeveloped** site **in** the Monument.	_____
_____	Camped in an **undeveloped** site **outside** of the Monument.	_____
_____	Camped in a **developed** campground **in** the Monument.	_____
_____	Camped in a **developed** campground **nearby** (National Park, State Park, Forest Service, or private)	_____
_____	Stayed at a **motel** in a nearby community.	_____
_____	Stayed at a **bed-and-breakfast** in a nearby community.	_____
_____	Spent the night in a **private home** (your own, a friend's, or family member's)	_____
_____	Other	_____

For the next two questions, we are interested in how you would rate the **importance of *and* your satisfaction with** specific items related to the overall quality of your recreation experience in the Monument.

6. In general, **how important** to you are each of the following items when visiting the Monument?

	Very Important	**Quite Important**	**Important**	**Somewhat Important**	**Not Important**
Brochures and maps	5	4	3	2	1
Educational displays at waysides	5	4	3	2	1
Visitor center displays	5	4	3	2	1
Information availability about recreation opportunities	5	4	3	2	1
Educational displays (in general)	5	4	3	2	1
History of Monument area	5	4	3	2	1
Historic sites	5	4	3	2	1
Geological information	5	4	3	2	1
Archeology (pre-historic Native American sites)	5	4	3	2	1
Paleontology (dinosaurs)	5	4	3	2	1
Wildlife	5	4	3	2	1
Plants	5	4	3	2	1
Monument road signs (entering & exiting Monument boundaries)	5	4	3	2	1
Directional signs to Monument visitor centers	5	4	3	2	1
Directional signs on roads to other Monument destinations	5	4	3	2	1
Monument trailhead markers	5	4	3	2	1
Condition of Monument trails	5	4	3	2	1
Condition of Monument roads	5	4	3	2	1
Condition of developed campsites	5	4	3	2	1
Condition of undeveloped roadside campsites	5	4	3	2	1
Availability of restroom facilities	5	4	3	2	1
Cleanliness of restroom facilities	5	4	3	2	1
Helpfulness of Monument employees	5	4	3	2	1
Safety information	5	4	3	2	1


Grand Staircase Escalante National Monument
Legend
Monument Boundary
To Salt Lake City
Panguitch
To Cedar City
Hatch
Tropic
Henrieville
Bryce Canyon National Park
Alton
Orderville
Glendale
Mt. Carmel Jct.
Kanab
To Zion
To North Rim of the Grand Canyon
Big Water
To Page, AZ
Escalante
Boulder
To Torrey
Glen Canyon National Recreation Area
Capitol Reef National Park
Kodachrome Basin State Park
Johns Valley Rd
Cottonwood Rd
Hole-in-the-Rock Rd
Smoky Mtn Rd
Burr Trail

For the next two questions, we are interested in how you would rate the **importance of** ***and*** **your satisfaction with** specific recreation and tourist services in the Monument area.

9. In general, **how important** to you are each of the following services when visiting the Monument area?

	Very Important	Quite Important	Important	Somewhat Important	Not Important
Lodging Services (motel, resort, lodge, cabin, B&B)	5	4	3	2	1
Campgrounds in the Monument	5	4	3	2	1
State Park/Forest Service/National Park Campgrounds	5	4	3	2	1
Privately Owned Campgrounds	5	4	3	2	1
Eating and Drinking Establishments	5	4	3	2	1
Grocery and Convenience Stores	5	4	3	2	1
Service Stations	5	4	3	2	1
Sporting Goods and Outdoor Equipment Stores	5	4	3	2	1
Souvenir Stores, Gift Shops, and Galleries	5	4	3	2	1
Guide and Outfitting Services	5	4	3	2	1
Local Transportation (shuttle services)	5	4	3	2	1
Emergency Medical Services	5	4	3	2	1
Search & Rescue Services	5	4	3	2	1
Monument Visitor Information Services	5	4	3	2	1

10. Now, please rate **how satisfied** you were with the following services during your actual visit to the Monument area. Check not applicable (n/a) for those services you did not use during your trip.

	n/a	Very Satisfied	Quite Satisfied	Satisfied	Somewhat Satisfied	Not Satisfied
Lodging Services (motel, resort, lodge, B&B)	❑	5	4	3	2	1
Campgrounds in the Monument	❑	5	4	3	2	1
State Park/Forest Service/National Park Campgrounds	❑	5	4	3	2	1
Privately Owned Campgrounds	❑	5	4	3	2	1
Eating and Drinking Establishments	❑	5	4	3	2	1
Grocery and Convenience Stores	❑	5	4	3	2	1
Service Stations	❑	5	4	3	2	1
Sporting Goods and Outdoor Equipment Stores	❑	5	4	3	2	1
Souvenir Stores, Gift Shops, and Galleries	❑	5	4	3	2	1
Guide and Outfitting Services	❑	5	4	3	2	1
Local Transportation (shuttle services)	❑	5	4	3	2	1
Emergency Medical Services	❑	5	4	3	2	1
Search & Rescue Services	❑	5	4	3	2	1
Monument Visitor Information Services	❑	5	4	3	2	1

11. In general, **how satisfied** were you with the **friendliness and helpfulness of service workers** in the surrounding communities during your trip?

6 Very Satisfied | 5 Satisfied | 4 Somewhat Satisfied | 3 Somewhat Dissatisfied | 2 Dissatisfied | 1 Very Dissatisfied

11a. In what ways were you satisfied or dissatisfied? _____

_____

_____

_____

_____

12. For each town you stopped in, **what did you do there**? **(check all that apply)**

Town:	Did not stop	Gas	Food	Lodging	Shopping (other than food or gas)	Recreation (hiking, camping, hiring a guide)	Explored the town	Visited friends/ family	Other (please list)
Page, AZ									
Fredonia, AZ									
Big Water									
Kanab									
Mt. Carmel Jct									
Orderville									
Glendale									
Hatch									
Panguitch									
Bryce Canyon Area									
Tropic									
Cannonville									
Henrieville									
Escalante									
Boulder									

13. In general, **how satisfied** were you with the **quality of service** provided in the surrounding communities during your trip?

6 Very Satisfied | 5 Satisfied | 4 Somewhat Satisfied | 3 Somewhat Dissatisfied | 2 Dissatisfied | 1 Very Dissatisfied

13a. In what ways were you satisfied or dissatisfied? _____

_____

_____

_____

_____

14. We are interested in **your group's expenditures** during your trip to the Monument area. For each visitor service listed below, please enter your best estimate of **your group's total expenditure** made in the Monument area including the surrounding communities. If you didn't spend any money on a particular visitor service, please indicate so by entering a zero (0). **Please, only indicate your group's total expenditures** made in the Monument area and surrounding communities, as portrayed by the preceding map in this survey.

Lodging Services (motel, resort, lodge, cabin, B&B, etc.)	$_____
Campgrounds in the Monument	$_____
State Park/Forest Service/National Park Campgrounds	$_____
Privately Owned Campgrounds	$_____
Eating and Drinking Establishments	$_____
Grocery and Convenience Stores	$_____
Service Stations (include gasoline/fuel/oil purchases)	$_____
Sporting Goods and Outdoor Equipment Stores	$_____
Souvenir Stores, Gift Shops, and Galleries	$_____
Guide and Outfitting Services	$_____
Local Transportation (shuttle services)	$_____

Other Expenditures (Please describe):

_____ $_____

_____ $_____

15. These expenditures are for how many people in your group? _____people

16. In what city/state or city/country did your trip begin in? _____
city/state or city/country

17. Did you use a commercial flight on your trip? ❑ Yes ❑ No

17a. If Yes, In what U.S. city did you arrive?_____

18. Please choose the response that best describes how you acquired the vehicle you were driving during your trip to the Monument area.

❑ Own ❑ Rented ❑ Leased ❑ Borrowed ❑ Other_____

19. What is the highest level of education you have completed?

- ❑ Have not finished high school
- ❑ High school diploma
- ❑ Some college, but no degree
- ❑ Technical, vocational, or 2 year degree
- ❑ Bachelor's degree
- ❑ Graduate or professional degree

20. What best describes the places where you lived when growing up?

- ❑ City of 100,000 or more
- ❑ Medium-sized town (5,000-25,000)
- ❑ Suburb of a large city
- ❑ Small town (less than 5,000 people)
- ❑ Small city (25,000-100,000)
- ❑ Farm, ranch, or other rural area

21. Please share any additional comments you have regarding your visit to the Grand Staircase-Escalante National Monument area and/or this survey.

Please tape the survey together on all three sides and place it in the mail.

No postage is necessary.

Thank you again for taking the time to complete this survey.
We really appreciate your assistance.

If you are interested in the final report of results of this survey, please visit the USU Institute for Outdoor Recreation and Tourism's website at www.cnr.usu.edu/iort in early 2005.

Institute for Outdoor Recreation and Tourism
Utah State University
5220 Old Main Hill
Logan, UT 84322-5220
(435) 797-7094

2006 Saint Anthony Sand Dunes Visitor Use Survey

Day Use Intercept Survey Instrument

OMB # 0596-0108 (pending)

Day Use/Local Resident

Date:_____
Day:_____
Time:_____
Location:_____
Gender: M F
Interviewer:_____
ID #_____

Hello, My name is _____ and I'm from Utah State University. We're conducting a survey of visitors to the Saint Anthony Sand Dunes area on behalf of the area's management. If you are willing to participate, I would like to ask you some questions about your current visit here. Any information you provide will be kept strictly confidential and will be used to help shape future onsite recreation management decisions. Would you be willing to spend a short amount of time to answer some questions?

YES NO

1) Is this your first trip to Saint Anthony Sand Dunes? **Yes** **No**

1a) **(If No)**, When was you first visit?_____

1b) **(If No)**, How often do you visit Saint Anthony Sand Dunes in a typical year?_____

2) Which activities are you doing in the St. Anthony Sand Dunes Area?

- □ Dune Buggy/Dune Rail Riding
- □ ATV Riding
- □ Hiking
- □ 4-Wheeling
- □ RV Camping
- □ Camping
- □ Hunting
- □ Fishing
- □ Mountain Biking
- □ Wildlife Watching
- □ Photography/Painting
- □ Antler/Rock/Wood Collecting
- □ Sandboarding
- □ Caving
- □ Snowmobiling
- □ Skiing
- □ Motorcycling/dirt biking
- □ Picnic/family reunion/party
- □ Other reason you are visiting?

_____

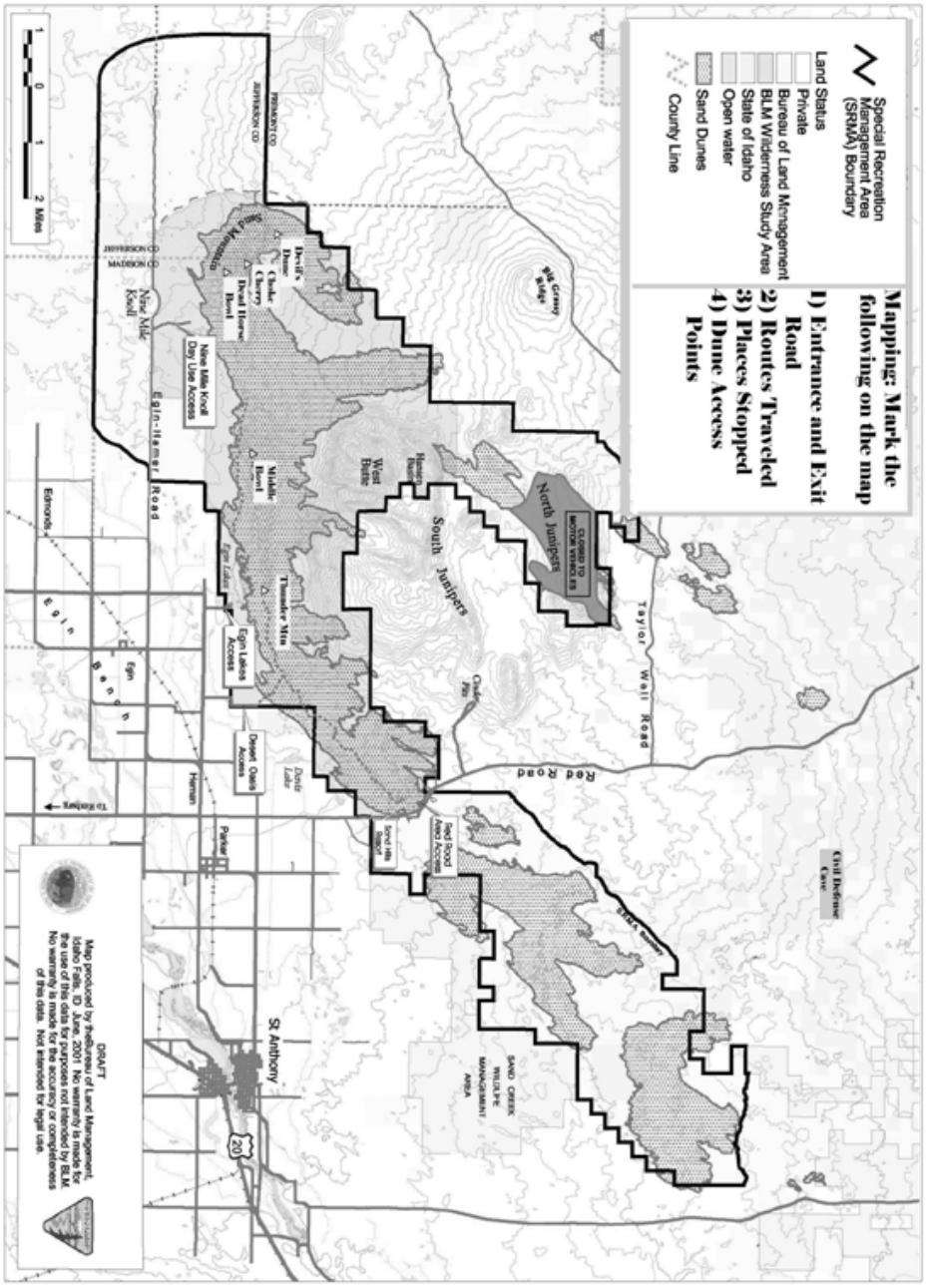
2a) Which activity would you say is the **main or primary activity** you are involved in **here**?_____

2b) About how often do you participate in this activity at **any** location during a typical year?_____
Number of times

2c) How would you describe your **level of skill** in [respondent's primary activity]?

- □ Beginner
- □ Intermediate
- □ Expert
- □ Professional

3) I would like to get an idea of where you have traveled during your trip here. On this map could you please show me what roads you have used, places you have stopped, locations where you have accessed the dunes or trails and location where you have camped? (*Follow Directions on map*)



4) Each visitor has many reasons for visiting the Saint Anthony Sand Dunes area. Please indicate how important **each** of the following reasons was for your trip.

	Not at all Important	Slightly Important	Moderately Important	Quite Important	Extremely Important
Be in a natural area	1	2	3	4	5
See beautiful scenery	1	2	3	4	5
Test my skill against nature	1	2	3	4	5
It was close to home	1	2	3	4	5
Be somewhere where I can make my own decisions	1	2	3	4	5
Do something with my family or friends	1	2	3	4	5
Get exercise	1	2	3	4	5
Learn about nature through experience	1	2	3	4	5
View wildlife	1	2	3	4	5
Experience solitude	1	2	3	4	5
Use outdoor skills	1	2	3	4	5
Be unconfined by rules and regulations	1	2	3	4	5
Test my skill against others in the same activity	1	2	3	4	5
Find excitement/thrills	1	2	3	4	5
Get away from it all	1	2	3	4	5
Improve my riding skills	1	2	3	4	5
Find peace and quiet	1	2	3	4	5
Be able to tell others I have been here	1	2	3	4	5
Satisfy others in my group who wanted to come here	1	2	3	4	5

5) How many people are in your group?_____

5a) How would you describe the makeup of your group?

- □ Family
- □ Friends
- □ Friends and Family
- □ Alone
- □ Organized group
- □ Couple
- □ Other?_____

5b) ♥**IF Friends, Family, or Friends and Family was indicated above**♥ Which of the following describe the members of your group:

- □ Immediate Family (Spouses, Children, etc)
- □ Extended Family (Cousins, Aunts, Uncles, etc)
- □ Colleagues/Work Friends
- □ Friends I met doing [**respondent's primary activity**]
- □ Neighbors
- □ Other?_____

5c) How often during a typical year do you travel with this group of people?_____

5d) Is this the only activity or type of trip that you take with this group? In other words, does the group you are here with get together only for the purpose of doing [**respondent's primary activity**].

YES **NO,**_____
What other activities do you do?

5e) ♥ **If they have indicated they are involved in motorized recreation**♥ ask all that apply**:**

How many ATVs are in your group? _____
How many Dune Buggies are in your group? _____
How many Dirt bikes/Motorcycles are in your group? _____
How many Snowmobiles are in your group? _____
How many 4-wheeldrive vehicles are in your group? _____

6) Have you visited the OPEN DUNES AREA during your trip?

□ NO(♥**SKIP TO QUESTION 7**♥) □ YES → If yes, how often?_____

6a) **Before you arrived at Saint Anthony Sand Dunes for this visit,** which of the following best describes your understanding of ***the number of other people*** you would find at the OPEN DUNES AREA?

□ **I had no idea** how many people I would see here. (♥**SKIP TO QUESTION 6D**♥)
□ **I had a vague idea** about how many people would be here
□ **I had a good idea** about how many people would be here
□ **I felt certain** about how many other people I would see here

6b) Once you arrived at the OPEN DUNES AREA, how similar or dissimilar was ***the number of people*** you found compared to what you had expected?

□ Very similar
□ Similar
□ Different } **How was the number of**
□ Very Different } **people different?**
□ There were fewer than expected
□ There were more people than expected

6c) **Before you arrived at Saint Anthony Sand Dunes for this visit,** Which of the following best describes your knowledge or understanding about the ***the types of activities and behaviors*** of visitors in the OPEN DUNES AREA?

□ **I had no idea** what other visitors would be doing here. (♥**SKIP TO QUESTION 6e**♥)
□ **I had a vague idea** about what other visitors would be doing here.
□ **I had a good idea** about what other visitors would be doing here.
□ **I felt certain** about what I would see others doing here.

6d) Once you arrived at the OPEN DUNES AREA, how similar or dissimilar were ***the types of activities and behaviors*** of other visitors compared to what you had expected?

□ Very similar
□ Similar
□ Different } **How were the actions**
□ Very Different } **and behaviors different?**_____
_____(open ended)

6e) How many people, other than those in your own group, would you estimate you saw in the OPEN DUNES AREA **during this visit**? _____

6f) Which of the following best describes your feelings about the number of people you saw in the OPEN DUNES AREA?

□ Far too many people
□ Somewhat too many people
□ About the right number of people
□ Somewhat too few people
□ Far too few people

6g) Do you feel there is a need to put a limit on the number of people who are able to use the OPEN DUNES AREA?

□ Definitely yes
□ Probably yes
□ Probably no
□ Definitely no
□ Don't know

IF YES, Why do you feel this area needs limits on use?

_____

_____

7) Have you visited the TRAILS OUTSIDE THE MAIN DUNES AREA during your trip?

□ NO(♥**SKIP TO QUESTION 9**♥) □ YES → If yes, how often?_____

7a) **Before you arrived at Saint Anthony Sand Dunes for this visit,** Which of the following best describes your understanding of ***the number of other people*** you would find on the TRAILS OUTSIDE THE MAIN DUNES AREA?

□ **I had no idea** how many people I would see here. (♥**SKIP TO QUESTION 7c**♥)
□ **I had a vague idea** about how many people would be here
□ **I had a good idea** about how many people would be here
□ **I felt certain** about how many other people I would see here

7b) Once you arrived on the TRAILS OUTSIDE THE MAIN DUNES AREA, how similar or dissimilar was ***the number of people*** you found compared to what you had expected?

□ Very similar
□ Similar
□ Different } **How was the number of**
□ Very Different } **people different?**
□ There were fewer than expected
□ There were more people than expected

7c) **Before you arrived at Saint Anthony Sand Dunes for this visit,** Which of the following best describes your knowledge or understanding about the ***the types of activities and behaviors*** of visitors on the TRAILS OUTSIDE THE MAIN DUNES AREA?

□ **I had no idea** what other visitors would be doing here. (♥**SKIP TO QUESTION 7e**♥)
□ **I had a vague idea** about what other visitors would be doing here.
□ **I had a good idea** about what other visitors would be doing here.
□ **I felt certain** about what I would see others doing here.

7d) Once you arrived on the TRAILS OUTSIDE THE MAIN DUNES AREA, how similar or dissimilar were ***the types of activities and behaviors*** of other visitors compared to what you had expected?

□ Very similar
□ Similar
□ Different } **How was this area**
□ Very Different } **different?** _____

7e) How many people, other than those in your own group, would you estimate you saw on the TRAILS OUTSIDE THE MAIN DUNES AREA **during this visit**? _____

7f) Which of the following best describes your feelings about the number of people you saw on the TRAILS OUTSIDE THE MAIN DUNES AREA?

□ Far too many people
□ Somewhat too many people
□ About the right number of people
□ Somewhat too few people
□ Far too few people

7g) Do you feel there is a need to put a limit on the number of people who are able to use the TRAILS OUTSIDE THE MAIN DUNES AREA?

□ Definitely yes
□ Probably yes
□ Probably no
□ Definitely no
□ Don't know

IF YES, Why do you feel this area needs limits on use?

_____

_____

9) During your trip to Saint Anthony Sand Dunes, how often have the actions and behaviors of the following people or groups detracted or negatively impacted from your visit?

	Never	Rarely	Some-times	Often	Continuously	Unless you checked Never, **what did this group do?**
ATVers, motorbikers, dunebuggie riders	◻	◻	◻	◻	◻	_____ _____ _____
Horseback riders	◻	◻	◻	◻	◻	_____ _____ _____
Hikers, backpackers, , cavers	◻	◻	◻	◻	◻	_____ _____ _____
Tent campers	◻	◻	◻	◻	◻	_____ _____ _____
Hunters and Fisherman	◻	◻	◻	◻	◻	_____ _____ _____
BLM staff and rangers	◻	◻	◻	◻	◻	_____ _____

10) Where do you live?:
City/town_____ State_____ Zip _____

11) What kind of job do you do?_____*(type of work, not employer!)*

12) When were you born?_____

13) Would you be willing to receive a more detailed mail survey to help us gain more information concerning your trip and your opinions about the area's management? **YES** **NO**

13a) **IF YES**, what is your mailing address?

_____

_____

_____

That's all of the questions that I have today, thank you so much for your time. If you have any additional comments you would like to share with the management of Saint Anthony Sand Dunes or about this survey, feel free to tell me now.

_____

_____

_____

_____

_____

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_____

_____

_____

_____

_____

_____

2006 Saint Anthony Sand Dunes Visitor Use Survey

Overnight Survey Instrument

(only sections which differ from day use intercept survey instrument)

5) Each visitor has many reasons for visiting the Saint Anthony Sand Dunes area. Please indicate how important **each** of the following reasons was for your trip.

	Not at all Important	Slightly Important	Moderately Important	Quite Important	Extremely Important
Be in a natural area	1	2	3	4	5
See beautiful scenery	1	2	3	4	5
Test my skill against nature	1	2	3	4	5
It was close to home	1	2	3	4	5
Be somewhere where I can make my own decisions	1	2	3	4	5
Do something with my family or friends	1	2	3	4	5
Get exercise	1	2	3	4	5
Learn about nature through experience	1	2	3	4	5
View wildlife	1	2	3	4	5
Experience solitude	1	2	3	4	5
Use outdoor skills	1	2	3	4	5
Be unconfined by rules and regulations	1	2	3	4	5
Test my skill against others in the same activity	1	2	3	4	5
Find excitement/thrills	1	2	3	4	5
Get away from it all	1	2	3	4	5
Improve my riding skills	1	2	3	4	5
Find peace and quiet	1	2	3	4	5
Be able to tell others I have been here	1	2	3	4	5
Satisfy others in my group who wanted to come here	1	2	3	4	5

6). Where have you stayed or where do you plan to stay during your trip *and* for how many nights (Check all that apply)?

- ◻ Desert Oasis _____*nights*
- ◻ Sand Hills _____*nights*
- ◻ Egin Lakes _____*nights*
- ◻ Hotel/Motel _____*nights*
- ◻ Dispersed Camping along Egin-Hammer Road _____*nights*
- ◻ Dispersed Camping along Red Road _____*nights*
- ◻ Other Dispersed Camping area? _____*nights*
- ◻ With a local resident _____*nights*
- ◻ *I am* a local resident

7) How many people are in your group?_____

7a) How would you describe the makeup of your group?

- ◻ Family
- ◻ Friends
- ◻ Friends and Family
- ◻ Alone
- ◻ Organized group
- ◻ Couple
- ◻ Other?_____

7b) ♥ **IF Friends, Family, or Friends and Family was indicated above** ♥ Which of the following describe the members of your group:

- ◻ Immediate Family (Spouses, Children, etc)
- ◻ Extended Family (Cousins, Aunts, Uncles, etc)
- ◻ Colleagues/Work Friends
- ◻ Friends I met doing **[respondent's primary activity]**
- ◻ Neighbors
- ◻ Other?_____

7c) How often during a typical year do you travel with this group of people?_____

7d) Is this the only activity or type of trip that you take with this group? In other words, does the group you are here with get together only for the purpose of doing [**respondent's primary activity**].

YES **NO,**_____
What other activities do you do?

7e) ♥ **If they have indicated they are involved in motorized recreation** ♥ ask all that apply:

- How many ATVs are in your group? _____
- How many Dune Buggies are in your group? _____
- How many Dirt bikes/Motorcycles are in your group? _____
- How many Snowmobiles are in your group? _____
- How many 4-wheeldrive vehicles are in your group? _____

10) Have you visited the CAMPING AND RV PARK AREAS during your trip?

□ NO(♥**SKIP TO QUESTION 11**♥) □ YES → If yes, how often?_____

10a) **Before you arrived at Saint Anthony Sand Dunes for this visit,** Which of the following best describes your understanding of ***the number of other people*** you would find at the PUBLIC CAMPING AND RV PARK AREAS?

□ **I had no idea** how many people I would see here. (♥**SKIP TO QUESTION 10c**♥)
□ **I had a vague idea** about how many people would be here
□ **I had a good idea** about how many people would be here
□ **I felt certain** about how many other people I would see here

10b) Once you arrived at the CAMPING AND RV PARK AREAS, how similar or dissimilar was ***the number of people*** you found compared to what you had expected *on the first day of your visit*?

□ Very similar
□ Similar
□ Different } **How was the number of**
□ Very Different } **people different?**
□ There were fewer than expected
□ There were more people than expected

10c) **Before you arrived at Saint Anthony Sand Dunes for this visit,** Which of the following best describes your knowledge or understanding about the ***the types of activities and behaviors*** of visitors at the CAMPING AND RV PARK AREAS?

□ **I had no idea** what other visitors would be doing here. (♥**SKIP TO QUESTION 10e**♥)
□ **I had a vague idea** about what other visitors would be doing here.
□ **I had a good idea** about what other visitors would be doing here.
□ **I felt certain** about what I would see others doing here.

10d) Once you arrived at the CAMPING AND RV PARK AREAS, how similar or dissimilar were ***the types of activities and behaviors*** of other visitors compared to what you had expected *on the first day of your visit*?

□ Very similar
□ Similar
□ Different } **How was this area**
□ Very Different } **different?** _____

♥♥**IF** THE VISITOR HAS **NOT USED** A **PUBLIC** CAMPING OR RV PARK AREA, **SKIP TO QUESTION 11!**♥♥

10e) How many people, other than those in your own group, would you estimate you saw in a PUBLIC CAMPING AND RV PARK AREAS **during this visit**? _____

10f) Which of the following best describes your feelings about the number of people you saw at the PUBLIC CAMPING AND RV PARK AREAS?

□ Far too many people
□ Somewhat too many people
□ About the right number of people
□ Somewhat too few people
□ Far too few people

1999 Utah State Park Boater Telephone Survey Instrument

1999-2000 Registered Boat Owner Telephone Survey

ID. _____

1. How many boats do you currently own? Please include any motorized boats, sailboats, or personal watercraft such as jet skis, wave runners, seadoos, etc. _____

   ☐ None **[GO TO Q 2]**
   ☐ One **[GO TO 1a.]**

   _____ **[NUMBER OF BOATS–GO TO 1b.]**

1a. **[IF ONE BOAT]** What type of boat is that, an . . .
   ☐ Open motorboat, ☐ Personal watercraft (like a jet ski or wave runner),
   ☐ Sail (only) boat, ☐ Cabin motorboat, ☐ Auxiliary sail boat, ☐
   Other:_____

1b. **[IF MORE THAN ONE BOAT]** How many are . . .
   ___Open motorboats ___Personal watercraft ___Sail (only) boats ___Canoes
   ___Cabin motorboats ___Auxiliary sail boats ___Rowboats ___ Other:_____

2. How many years have you operated a boat, including personal watercraft? _____

3. In the past 12 months, approximately how many outings did you take to use your boat(s) in Utah? _____ **[PROBE:** What is your best guess?] **[IF NONE, GO TO Q6]**

4. In the past 12 months, how many days did you typically stay on a boat *outing*, including travel time to and from the boating location? _____

   [NOTE: IF Q3 OR Q4 IS MISSING OR DK–GO TO Q5]

4a. Let me verify that information. You made about ___ [Q3-x] boat outings in the past 12 months and you typically spent ____ [Q4-y] days on each boat outing. Is that correct?
   [IF "NO," GET CORRECT INFORMATION AS NEEDED]
   ☐ YES ☐ NO

5. Approximately how many gallons of fuel did you use on your boats and personal watercraft, *per outing*, during the past 12 months? This should *not* include the fuel required to get you to and from your boating destination. _____ [GALLONS]

6. The next set of questions deals with where you would like to see your boat registration funds spent. Do you believe it is very important, moderately important, slightly important, or not important that your boat registration funds are spent on . . . **(REPEAT SCALE AS NEEDED)**

	NOT IMPORTANT	SLIGHTLY IMPORTANT	MODERATELY IMPORTANT	VERY IMPORTANT
printed facility guides?				
How about for *pump-out facilities?*				
How about for *safety patrols*?				
For *boating education programs*?				
For *picnic areas and campsites*?				
How about for *parking*?				
For *launching facilities?*				
How about for *restrooms?*				
For *law enforcement?*				
OTHER (VOLUNTEER) USE?				

Now I'd like you to think about your boating preferences.

7. On which Utah lakes have you gone boating in the last 12 months?

[LIST AREAS]	How many times did you boat at . . .?
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

[PROBE: Any others?**]**

8. Which Utah boating area would you say is your favorite? _____

[DO NOT READ RESPONSES]

☐ BEAR LAKE	☐ DEER CREEK	☐ LAKE POWELL	☐ PINEVIEW
☐ FLAMING GORGE	☐ ROCKPORT	☐ SCOFIELD	☐ STAWBERRY
☐ UTAH LAKE	☐ WILLARD BAY	☐ JORDANELLE	☐ OTHER

8a. What is the MOST important reason _____ [LAKE] is your favorite boating area?

_____

_____

[DO NOT READ RESPONSES]

☐ PROXIMITY/DISTANCE FROM HOME	☐ FISHING
☐ CAMPGROUND/PICNIC AREA	☐ BEACH AREAS
☐ LAKE SIZE	☐ SOCIAL–FAMILY/FRIENDS
☐ BOAT LAUNCHES	☐ SAFETY
☐ WATER TEMPERATURE	☐ SCENIC BEAUTY/PRETTY
☐ FEWER BOATS/LESS CROWDED	☐ GOOD SKIING

8b. Are there any other reasons? **[NOTE 2, 3 ETC. ON LIST IF APPROPRIATE]**

_____

_____

9. Which Utah boating area would you say is your LEAST favorite? _____

[DO NOT READ RESPONSES]

☐ BEAR LAKE	☐ DEER CREEK	☐ LAKE POWELL	☐ PINEVIEW
☐ FLAMING GORGE	☐ ROCKPORT	☐ SCOFIELD	☐ STAWBERRY
☐ UTAL LAKE	☐ WILLARD BAY	☐ JORDANELLE	☐ OTHER

9a. What is the MOST important reason _____ [LAKE] is your least favorite area?

_____

_____

9b. Are there any other reasons _____ is your least favorite boating area?

_____

_____

10. I'm going to read you a list of activities. For each, please tell me if you participate in that activity when you go boating, and, if so, do you do it "rarely," "sometimes," "often," or "always." Do you . . .

[**IF YES:** How often would you say . . .]

ACTIVITY	NO/NEVER	RARELY	SOMETIMES	OFTEN	ALWAYS
waterski, tube, or knee board?					
swim from a boat?					
sail?					
go sightseeing on the lake?					
canoe or kayak?					
fish from a boat?					
just drive the boat around for fun?					

10a. **[IF MORE THAN ONE]** Which of these is your *primary* activity when you go boating? **[REPEAT LIST IF NECESSARY]** _____

11. Now I'd like you to think about boating safety for a moment. What is the *primary* source from which you have obtained your boating safety knowledge?

[DO NOT READ RESPONSES]

☐ PARENTS ☐ FRIENDS ☐ COURSE/CLASS ☐ VIDEO
☐ BOOK ☐TV ☐ RADIO ☐ BILLBOARD
☐ PAMPHLET ☐ SPOUSE ☐ PARK RANGER ☐ INTERNET
☐ OTHER (Specify:) _____

11a. Where did you *most recently* see or hear boating safety information?

[DO NOT READ RESPONSES]

☐ PARENTS ☐ FRIENDS ☐ COURSE/CLASS ☐ VIDEO
☐ BOOK ☐TV ☐ RADIO ☐ BILLBOARD
☐ PAMPHLET ☐ SPOUSE ☐ PARK RANGER ☐ INTERNET
☐ OTHER (Specify:) _____

12. Have you ever completed a boating education course? ☐ YES ☐ NO ☐ DK

13. Would you say that boating education courses are . . .
☐ not important,
☐ somewhat important, or ☐ DON'T KNOW
☐ very important?

14. Do you believe that boating education courses should be mandatory for all boat operators?
☐ YES ☐ NO ☐ DEPENDS ☐ DON'T KNOW

14a. **[IF "DEPENDS"]:** What does it depend on? _____
_____

15. Do you believe that all boat operators should be licensed to operate a boat? This means that operator privileges could be revoked for certain boating violations.

☐ YES ☐ NO ☐ DEPENDS ☐ DON'T KNOW

15a. **[IF "DEPENDS"]:** What does it depend on? _____
_____

16. Do you strongly agree, somewhat agree, are neutral, somewhat disagree, or strongly disagree with the following statement? "I support the use of personal watercraft on Utah lakes."
☐ STRONGLY AGREE
☐ SOMEWHAT AGREE
☐ NEUTRAL ☐ DON'T KNOW
☐ SOMEWHAT DISAGREE
☐ STRONGLY DISAGREE

16a. **[IF AGREE OR DISAGREE]** And why is that?
_____
_____
_____
[PROBE: Are there any other reasons you SUPPORT/DO NOT SUPPORT the use of personal watercraft on Utah lakes?]

17. Do you believe personal watercraft should be regulated differently than other boats?
☐ YES ☐ NO ☐ DON'T KNOW

17a. [IF YES] How should personal watercraft be regulated differently than other boats?

_____

_____

[**PROBE:** anything else?]

18. On a scale from 1 to 5, where 1 means NOT AT ALL CROWDED, and 5 means VERY CROWDED, how would you rate the boat usage on lakes in Utah?

☐ 1=NOT CROWDED
☐ 2
☐ 3 ☐ DON'T KNOW
☐ 4
☐ 5=VERY CROWDED

18a. **[IF 3, 4, OR 5]** Do you have any suggestions for how to make Utah lakes less crowded?

☐ YES ☐ NO ☐ DON'T KNOW

18b. **[IF YES]** What suggestions do you have for making Utah lakes less crowded?

_____

_____

_____

19. In GENERAL, do you feel that the actions of some lake users detract from your enjoyment while you're boating in Utah?

☐ YES ☐ POSSIBLY ☐ NO ➔[IF NO, GO TO Q#20]

19a How often is your boating enjoyment reduced by the actions of others when you go boating on Utah lakes? Would you say . . .
☐ rarely (by that I mean on *some outings but not on every outing*),
☐ infrequently (about once per outing)
☐ sometimes (about 2 or 3 times per outing),
☐ often (about 4 or 5 times per outing), or
☐ very often (more than 5 times per outing).

19b Which types of activities, actions, or lake users detract from your enjoyment?

_____

_____

[**PROBE:**"Do any other actions detract from your enjoyment?"]

20. In *general*, do you think there is a need to put a limit on the number of boats that can use a lake at one time? Would you say . . .

☐ definitely yes,
☐ probably yes,
☐ probably no, or ➔
☐ definitely no. ➔
☐ DON'T KNOW ➔

GO TO QUESTION 21 ON PAGE 9

20a. **[IF YES]** Why do you feel that use limits are needed?

_____

_____

[**PROBE :** Any other reasons? UNTIL NO MORE ARE GIVEN]

20b Do you think you would feel the same if you were limited from boating on a lake you had planned to use on a certain day because of the use limitations? Would you say . . .

☐ definitely yes,
☐ probably yes,
☐ probably no, or
☐definitely no.
☐DON'T KNOW

20c On which lakes do you feel that use limits are needed? [**PROBE:** Any others?]

LAKE 1:_____ LAKE 4: _____
LAKE 2:_____ LAKE 5: _____
LAKE 3:_____ LAKE 6: _____

[REPEAT FOLLOWING QUESTION SERIES FOR UP TO THREE LAKES]
[IF NO LAKES LISTED–GO TO Q 21]

20d. Why do you think use limits are needed on _____ [LAKE 1, Q20c]?

_____

_____

20e. If you were not able to get on [LAKE 1] as a result of restrictions on the number of boats that are allowed on the lake, do you think you would wait there for an opening, try boating somewhere else, or do something totally different?

❑ WAIT FOR AN OPENING AT SAME LAKE
❑ TRY BOATING SOMEWHERE ELSE ➔➔➔ Where do you think you would go
❑ DO SOMETHING TOTALLY DIFFERENT
❑ UNSURE/DEPENDS

20f. Do you think you would feel the same about the need for use limitations on [LAKE 1] if you were limited from boating there because of use limitations on a day you planned to use the lake? Would you say . . .

☐ definitely yes,
☐ probably yes,
☐ probably no, or ☐DON'T KNOW
☐definitely no.

[REPEAT IF NECESSARY FOR LAKE 2 ON Q 20c *OR* GO TO Q 21]

20g. Why do you think use limits are needed on _____ [LAKE 2, Q20c]?

_____
_____

20h. If you were not able to get on [LAKE 2] as a result of restrictions on the number of boats that are allowed on the lake, do you think you would wait there for an opening, try boating somewhere else, or do something totally different?

❑ WAIT FOR AN OPENING AT SAME LAKE
❑ TRY BOATING SOMEWHERE ELSE ➔➔➔ Where do you think you would go
❑ DO SOMETHING TOTALLY DIFFERENT
❑ UNSURE/DEPENDS

20i. Do you think you would feel the same about the need for use limitations on [LAKE 2] if you were limited from boating there because of use limitations on a day you planned to use the lake? Would you say . . .

☐ definitely yes,
☐ probably yes,
☐ probably no, or ☐DON'T KNOW
☐definitely no.

[REPEAT IF NECESSARY FOR LAKE 3 ON Q 20c *OR* GO TO Q 21]

20j. Why do you think use limits are needed on _____ [LAKE 3, Q20c]?

_____
_____

20k. If you were not able to get on [LAKE 3] as a result of restrictions on the number of boats that are allowed on the lake, do you think you would wait there for an opening, try boating somewhere else, or do something totally different?

❑ WAIT FOR AN OPENING AT SAME LAKE
❑ TRY BOATING SOMEWHERE ELSE ➔➔➔ Where do you think you would go
❑ DO SOMETHING TOTALLY DIFFERENT
❑ UNSURE/DEPENDS

20l. Do you think you would feel the same about the need for use limitations on [LAKE 3] if you were limited from boating there because of use limitations on a day you planned to use the lake? Would you say . . .

☐ definitely yes,
☐ probably yes,
☐ probably no, or ☐DON'T KNOW
☐definitely no.

21. Next I'd like to read you a list of *potential* problems or concerns that may occur at various lakes. For each, please tell me if you think it is a problem on the Utah lakes you are familiar with, and if so, is it a small, moderate, or major problem.

[**IF YES:** Is it a small, moderate or major problem?]

PROBLEM	**NOT PROBLEM**	**SMALL PROBLEM**	**MODERATE PROBLEM**	**MAJOR PROBLEM**
Is drug or alcohol abuse by boaters a problem?				
Reckless motorboat operators?				
Reckless personal watercraft operators?				
Too many boats on the water at one time?				
Crowding at launch ramps & parking areas?				
Crowding at beaches and facilities?				
Safety problems on the water?				
Uneducated motorboat operators?				
Uneducated personal watercraft operators?				

Finally, I have just a few personal questions that are for statistical purposes only. **As with all the questions on the survey, these questions are *completely* confidential.**

22. What was your age on your last birthday? _____

23. Including yourself, how many people in your household operate boats? _____

24. How many people are there living or staying in your household, including yourself? _____

24a. Of these 'x' people, how many are 17 or younger? _____

25. What was your *total* combined household income from all wage earners during the past 12 months? Please include money from all sources, not just wages and salaries, before taxes and other deductions. Was it . . .

- ☐ Less than $20,000,
- ☐ between $20,000 and $40,000,
- ☐ between $40,000 and $60,000,
- ☐ between $60,000 and $80,000.
- ☐ between $80,000 and $100,000, or
- ☐ more than $100,000?

26. What is the highest year or grade of school you have completed?

- ☐ Junior high or less (8th grade or less),
- ☐ Some high school (9th, 10th, 11th, 12th, not a high school grad)
- ☐ High school grad or GED
- ☐ Some college or vocational school
- ☐ Technical or vocational school grad. or Associates degree
- ☐ College graduate (4 years, Bachelor's degree)
- ☐ Some graduate courses
- ☐ Graduate/Professional degree (MA,MS,PhD,JD,MD,etc.)

Thank you very much for your time and help!!

Do you have any other comments about boating on Utah Lakes that you would like to make?

Would you like to receive a brief summary of the results? ____ NO _____ YES [IF YES, VERIFY CORRECT ADDRESS]

Once again, thanks for you help and patience.

2006 Utah State Park Boating Survey

Telephone Survey Instrument

2006 Recreational Water Use Capacity on Utah's Lakes and Reservoirs Telephone Survey

Hello. May I speak to (Name of Registered Boat Owner). I am calling from Discovery Research on behalf of Utah State University and Utah State Parks. We are doing a statewide telephone survey of registered boat owners to collect information about recreational water use in Utah. This information will help park managers maintain quality recreational experiences and services, protect the lakes, and identify areas of concern.

This telephone survey is completely voluntary. You are free to discontinue or to not answer questions from the survey at anytime. To assure confidentiality, your personal information will not be included in the final report. The survey should take about 15 minutes. Is it OK if we do the survey now?

1. How many boats do you currently own? Please include any motorized boats, sailboats, or personal watercraft such as jet skis, wave runners, seadoos, etc. _____

None **[Thank the respondent and end the interview – This is not a completed interview]**
One **[GO TO 1a.]**
_____ **[NUMBER OF BOATSBGO TO 1b.]**

1a. **[IF ONE BOAT]** What type of boat is that, a/an . . .
Open motorboat, Personal watercraft (like a jet ski or wave runner),
Sail (only) boat, Cabin motorboat, Auxiliary sail boat, Other:_____

1b. **[IF MORE THAN ONE BOAT]** How many are . . .
___Open motorboats ___Personal watercraft ___Sail (only) boats ___Canoes
___Cabin motorboats ___Auxiliary sail boats ___Rowboats ___Other:_____

2. How many years have you operated a boat, including personal watercraft? _____

The following Questions are about your Boating Preferences.

3. In the past 12 months, approximately how many outings did you take using your boat(s) in Utah? _____ **[PROBE:** What is your best guess?] **[IF NONE, GO TO Q6]**

[AN OUTING IS DEFINED AS ANY TRIP TO A WATER BODY WITH A BOAT]

4. In the past 12 months, how many days did you typically stay on a boat outing, including travel time to and from the boating location? _____

5. On which Utah lakes or reservoirs have you gone boating in the last 12 months?
PROBE: ANY OTHERS?
[LIST AREAS] How many times did you boat at . . .?

If Lake Powell, Utah Lake, or Flaming Gorge is mentioned, ask specifically where. For example, for Lake Powell – it could be Wahwep/Page area OR Bullfrog area.

6. Which Utah boating area would you say is your favorite? _____

6a. What is the MOST important reason _____ is your favorite boating area?
_____
_____

6b. Are there any other reasons?
_____
_____

7. Which Utah boating area would you say is your LEAST favorite? _____

7a. What is the MOST important reason _____ is your least favorite area?
_____
_____

8. The next set of questions deals with where you would like to see your boat registration funds spent. Do you believe it is very important, moderately important, slightly important, or not important that your boat registration funds are spent on . . .
(REPEAT SCALE AS NEEDED)

	VERY IMPORTANT	MODERATELY IMPORTANT	SLIGHTLY IMPORTANT	NOT IMPORTANT
printed facility guides?				
pump-out facilities?				
safety patrols?				
boating education programs?				
picnic areas and campsites?				
parking?				
launching facilities?				
non-motorized boating facilities				
restrooms?				
law enforcement?				

9. I am going to read you a list of activities. For each, please tell me if you participate in that activity when you go boating, and, if so, do you do it rarely, sometimes, often, or always. Do you . . .

[**IF YES:** How often would you say . . .]

ACTIVITY	**NEVER**	**RARELY**	**SOMETIMES**	**OFTEN**	**ALWAYS**
waterski, tube, or knee board?					
wakeboarding?					
swim from a boat?					
sail?					
go sightseeing on the lake?					
canoe or kayak?					
fish from a boat?					
just drive the boat around for fun?					

9a. **[IF MORE THAN ONE]** Which of these is your *primary* activity when you go boating? **[REPEAT LIST IF NECESSARY]** _____

10. Now I would like you to think about boating safety for a moment. What is the *primary* source where you obtained your boating safety knowledge?

10a. Where did you *most recently* see or hear boating safety information?

11. Have you ever completed a boating education course? YES NO DO NOT KNOW

12. Do you strongly agree, somewhat agree, are neutral, somewhat disagree, or strongly disagree with the statement? "Boating education courses are important."

STRONGLY AGREE
SOMEWHAT AGREE
NEUTRAL DO NOT KNOW
SOMEWHAT DISAGREE
STRONGLY DISAGREE

13. Do you strongly agree, somewhat agree, are neutral, somewhat disagree, or strongly disagree with the statement? "Boating education courses should be mandatory for all boat operators."

STRONGLY AGREE
SOMEWHAT AGREE
NEUTRAL DO NOT KNOW
SOMEWHAT DISAGREE
STRONGLY DISAGREE

14. How about the statement? "All boat operators should be licensed to operate a boat." This means that operator privileges could be revoked for certain boating violations.

STRONGLY AGREE
SOMEWHAT AGREE
NEUTRAL DO NOT KNOW
SOMEWHAT DISAGREE
STRONGLY DISAGREE

15. How about the statement? " I support the use of personal watercraft on Utah lakes."

STRONGLY AGREE
SOMEWHAT AGREE
NEUTRAL DO NOT KNOW
SOMEWHAT DISAGREE
STRONGLY DISAGREE

15a. **[IF DISAGREE]** And why is that?

_____
_____
_____

[**PROBE:** Are there any other reasons you DO NOT SUPPORT the use of personal watercraft on Utah lakes?]

16. Do you believe personal watercraft should be regulated differently than other boats?
YES NO DO NOT KNOW

16a. [IF YES] How should personal watercraft be regulated differently than other boats?

_____
_____

[**PROBE:** anything else?]

17. In GENERAL, do you feel that the actions of some lake users detract from your enjoyment while you are boating in Utah?

YES POSSIBLY NO [GO TO Q#18]

17a. How often is your boating enjoyment reduced by the actions of others when you go boating on Utah lakes? Would you say . . .
rarely (by that I mean on *some outings but not on every outing*),
infrequently (maybe once per outing)
sometimes (about 2 or 3 times per outing),
often (about 4 or 5 times per outing), or
very often (more than 5 times per outing).

17b. Which types of activities, actions, or lake users detract from your enjoyment?

_____
_____

[**PROBE:** Do any other actions detract from your enjoyment?]

18. In general, do you think there is a need to put a limit on the number of boats that can use a lake at one time? Would you say . . .
definitely yes,
probably yes,
probably no, or
definitely no.
DO NOT KNOW

18a. **[IF YES]** Why do you feel use limits are needed?

_____
_____

[**PROBE :** Any other reasons? UNTIL NO MORE ARE GIVEN]

[IF NO LAKES LISTED - GO TO Q 19]

[REPEAT FOLLOWING QUESTION SERIES FOR UP TO TWO LAKES – CHOOSE THE FIRST TWO LAKES ON THE LIST]

NOTE: IF A LAKE OR RESERVOIR THAT IS NOT LISTED BELOW IS INDICATED BY THE RESPODENT, PLEASE ASK ABOUT THAT LAKE OR RESERVOIR AS LAKE #2

PINEVIEW JORDANELLE DEER CREEK WILLARD BAY EAST CANYON QUAIL CREEK

18c. Why do you think use limits are needed on _____ [LAKE 1, Q19b]?
_____
_____

18d. If you were not able to get on [LAKE 1] as a result of restrictions on the number of boats that are allowed on the lake, do you think you would wait there for an opening, try boating somewhere else, or do something totally different?

WAIT FOR AN OPENING AT SAME LAKE
TRY BOATING SOMEWHERE ELSE -- Where do you think you would go? _____
DO SOMETHING TOTALLY DIFFERENT
UNSURE

19. Next I would like to read you a list of *potential* problems or concerns that may occur at various lakes. For each, please tell me if you think it is a problem on the Utah lakes you are familiar with, and if so, is it a small, moderate, or major problem.
[**IF YES:** Is it a small, moderate or major problem?]

PROBLEM	NOT PROBLEM	SMALL PROBLEM	MODERATE PROBLEM	MAJOR PROBLEM
Is drug or alcohol abuse by boaters a problem?				
How about…reckless motorboat operators?				
How about… reckless personal watercraft operators?				
How about…too many boats on the water at one time?				
How about…crowding at launch ramps & parking areas?				
How about…crowding at beaches and facilities?				
How about…fluctuating water levels?				
How about…safety problems on the water?				

20. For the following questions, please tell me if you would strongly agree, agree, disagree or strongly disagree with the following action at your favorite water-based State Park in Utah:
Note: If the respondent mentioned Lake Powell or Flaming Gorge as their favorite (SEE QUESTION #6) – tell them that we want to hear about their favorite state park. If they say that they do not have a favorite state park – have them discuss a park they use frequently or live near (find out which one they are talking about).

20a. Increase the number of boater education programs

STRONGLY AGREE
SOMEWHAT AGREE
NEUTRAL
SOMEWHAT DISAGREE
STRONGLY DISAGREE

20b. Expand the parking lot to allow more boats on the water

STRONGLY AGREE
SOMEWHAT AGREE
NEUTRAL
SOMEWHAT DISAGREE
STRONGLY DISAGREE

20c. Expand the boat ramp to increase the number of boats that could be launched at on time

STRONGLY AGREE
SOMEWHAT AGREE
NEUTRAL
SOMEWHAT DISAGREE
STRONGLY DISAGREE

20d. Increase fees to improve infrastructure (such as boat ramps, restrooms, picnic area

STRONGLY AGREE
SOMEWHAT AGREE
NEUTRAL
SOMEWHAT DISAGREE
STRONGLY DISAGREE

20e. Increase the number of law enforcement patrols on the water

STRONGLY AGREE
SOMEWHAT AGREE
NEUTRAL
SOMEWHAT DISAGREE
STRONGLY DISAGREE

20f. Decrease the number of law enforcement patrols on the water

STRONGLY AGREE
SOMEWHAT AGREE
NEUTRAL
SOMEWHAT DISAGREE
STRONGLY DISAGREE

20g. Limit Personal Water Craft to certain areas on the water

STRONGLY AGREE
SOMEWHAT AGREE
NEUTRAL
SOMEWHAT DISAGREE
STRONGLY DISAGREE

20h. Separate motor boats from PWC on the water

STRONGLY AGREE
SOMEWHAT AGREE
NEUTRAL
SOMEWHAT DISAGREE
STRONGLY DISAGREE

20i. Prohibit PWC, waterskiing or similar activity on the water for 2 weekdays during the week

STRONGLY AGREE
SOMEWHAT AGREE
NEUTRAL
SOMEWHAT DISAGREE
STRONGLY DISAGREE

20j. Add additional or create no-wake zones

STRONGLY AGREE
SOMEWHAT AGREE
NEUTRAL
SOMEWHAT DISAGREE
STRONGLY DISAGREE

20k. Prohibit PWC, waterskiing or similar activity in the early morning or late evening

STRONGLY AGREE
SOMEWHAT AGREE
NEUTRAL
SOMEWHAT DISAGREE
STRONGLY DISAGREE

20l. Reduce the number of boats allowed on the water on some of the heavier use days

STRONGLY AGREE
SOMEWHAT AGREE
NEUTRAL
SOMEWHAT DISAGREE
STRONGLY DISAGREE

Finally, I have just a few personal questions that are for statistical purposes only. **As with all the questions on the survey, these questions are *completely* confidential.**

21. What was your age on your last birthday? _____

22. What is your zip code?_____

23. Including yourself, how many people in your household operate boats? _____

24. How many people are there living or staying in your household, including yourself?

24a. Of these x people, how many are 17 or younger?

25. What was your *total* combined household income from all wage earners during the past 12 months? Please include money from all sources, not just wages and salaries, before taxes and other deductions. Was it . . .

Less than $25,000,
between $25,000 and $45,000,
between $45,000 and $65,000,
between $65,000 and $85,000.
between $85,000 and $105,000,
between $105,000 and $125,000,
between $125,000 and $150,000,
between $150,000 and $200,000,
or
more than $200,000

26. What is the highest year or grade of school you have completed?

Junior high or less
Some high school
High school grad or GED
Some college or vocational school
Technical or vocational school grad. or Associates degree
College graduate (4 years, Bachelors degree)
Some graduate courses
Graduate/Professional degree

Thank you for your time and participation in this survey. This information will assist Utah State Parks in making your water recreation experience more enjoyable for you.