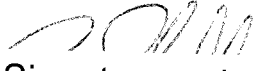


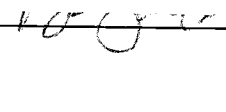
AN ABSTRACT OF THE THESIS OF

Mark W. Brunson for the degree of Master of Sciences in
Forest Resources presented on May 4, 1989

Title: A Model of Campsite Choice in Dispersed Recreation
Settings


Signature redacted for privacy.

Abstract approved: _____

 / Bo Shelby

Research on campsite selection behavior has given managers of outdoor recreation resources a better understanding of users' needs and preferences. However, researchers have found nagging inconsistencies, not only across settings but also between campers' stated preferences and their actual behavior. This thesis re-examines the campsite selection research in light of more recent studies of recreationists' decision-making processes. A model is developed and tested in two popular recreation areas in the Pacific Northwest.

Analysis of previous research suggests a three-stage campsite choice model, mitigated by a satisficing mechanism. Campers first consider whether potential sites have "necessity attributes" which meet basic camping needs. Sites which pass this test are then evaluated for "experience attributes" which can facilitate preferred experience outcomes. "Amenity attributes" not central to the camping experience are weighed in a final stage. However, the process may be cut short due to incomplete information,

fatigue, perceived competition for sites, or goal differences within the camping party.

The model was tested by surveying visitors to the Deschutes River State Scenic Waterway in Oregon and Alpine Lakes Wilderness in Washington. Respondents were asked to rate the importance of various campsite attributes and of a series of experience goals. In both settings, necessity attributes tended to be rated most important, followed by experience attributes and amenity attributes. Correlation analysis confirmed that experience attributes are rated more highly when people believe they can enhance the likelihood of achieving experience goals. However, respondents in both surveys stressed one or two experience attributes that they rated more highly than some necessity attributes.

The high importance ratings given to certain experience attributes may indicate that experience goals can be so important that achieving them is a necessity. It is also likely that the research methodology could have encouraged over-emphasis of experience attributes. Ways of avoiding methodological pitfalls in future research are discussed, as are potential extensions of campsite choice research based upon the model.

A Model of Campsite Choice
in Dispersed Recreation Settings

by

Mark W. Brunson

A THESIS

submitted to

Oregon State University

in partial fulfillment
of the requirements for
the degree of

Master of Sciences

Completed May 4, 1989

Commencement June 1989

ACKNOWLEDGEMENTS

This thesis is dedicated to my wife, Cheryl, who has done so much to assist me in my pursuit of a graduate degree. Without Cheryl's love and encouragement, and the help of my Lord God, I never could have been able to complete this.

I am also indebted to my major professor, Bo Shelby, who has gently guided my education without trying to steer me toward any particular viewpoint, and has led me to accomplish more than I guessed I could. Invaluable help throughout my stay at OSU has also been provided by the other members of my committee, Rebecca Johnson and Gordon Matzke.

Finally, I must thank those fellow students who have offered their ideas and encouragement over the past two years: Bruce Shindler, Marlene Finley, John Baas, Bill Stack, Doug Whittaker, Eric Moore, Marty Lee, Brent Grasty, Denver Hospodarsky, Chris Friend, Dave Anderson and Jay Goodwin. I hope our many discussions have been as valuable for them as they've been for me.

TABLE OF CONTENTS

INTRODUCTION	1
A MODEL OF CAMPSITE CHOICE	4
Previous campsite selection research	4
Modeling campsite selection behavior	9
TESTING THE CAMPSITE MODEL	17
Research hypotheses	17
Overview of methods	17
TEST 1: DESCHUTES RIVER STATE SCENIC WATERWAY	20
The setting	20
Survey methods	21
Results	24
Discussion	30
TEST 2: THE ENCHANTMENTS	35
The setting	35
Survey methods	36
Results	39
Discussion	49
CONCLUSION: IMPROVEMENTS AND IMPLICATIONS	57
BIBLIOGRAPHY	64
APPENDICES	69
A. Water and scenery as factors in campsite choice	69
B. Sample questions for further tests of the campsite model	74

LIST OF TABLES

1. Campsite choice criteria identified in previous studies	5
2. Relative importance of attributes in camper surveys	7
3. Importance scores for Deschutes campsite attributes	25
4. Correlation of experience attributes with boater motives	27
5. Correlation of experience attributes with non-boater motives	27
6. Correlation of necessity attributes with boater motives	29
7. Correlation of necessity attributes with non-boater motives	29
8. Importance scores for Enchantments campsite attributes	40
9. Primary recreational activities of Enchantments visitors	42
10. Attribute importance scores for campers	43
11. Attribute importance scores for climbers	44
12. Attribute importance scores for hikers	45
13. Correlation of experience attributes with trip motives	48
14. Correlation of necessity attributes with trip motives	50
15. Importance scores for Enchantments trip motives	53

A MODEL OF CAMPSITE CHOICE
IN DISPERSED RECREATION SETTINGS

INTRODUCTION

Outdoor recreation managers have long recognized that management strategies are most efficient when they reflect both the characteristics of recreation settings and the experiences sought by recreational users. Much research effort has been devoted to exploring the linkage between experience goals and setting attributes. An early focus of this research was on campsite choice behavior, specifically on identifying the characteristics of recreation settings that are most highly sought by campers and are most conducive to a satisfactory camping experience.

Campsite choice behaviour has remained a popular topic for recreation researchers, although the impetus for their research has undergone several shifts as managers' needs changed over the past two decades. Studies conducted during the wilderness recreation boom of the late 1960s and early 1970s were often aimed at identifying locations suitable for additional campsites (Schomaker, 1973; Brown and Schomaker, 1974). Later, as the growth of backcountry camping slowed, attention was turned to the fast-growing segment of national forest users who engage in "roaded dispersed recreation" on lands designated for multiple use. The supply of campsites was no longer a concern, but managers sought to identify

critical "recreation habitat" that could be preserved during planning for timber harvest and other activities (Clark and Stankey, 1986). For government agencies forced to close campgrounds as a cost-cutting measure, campsite studies have helped managers choose which facilities to shut down by identifying those which are least able to meet campers' needs. Such studies have also been used to pinpoint ways in which visitation could be enhanced at under-utilized settings (Bumgardner et al., 1988). And with the advent of management techniques such as wilderness zoning (Haas et al, 1987), the Carrying Capacity Assessment Process (Shelby and Heberlein, 1986), and Limits of Acceptable Change (Stankey et al, 1985), managers are finding they need to know more about the desired characteristics of recreation settings, including campsites, in order to determine standards for making use-impact evaluations (Harris, 1982; Parsons, 1986).

Campsite choice behavior has been examined in a wide variety of settings. Studies have been conducted among visitors to auto campgrounds (Lime, 1971), alpine wilderness areas (Harris, 1982), whitewater rivers (Pfister, 1977) and roadside clearings (Clark et al., 1984). This research has uncovered similarities in campsite choice behavior, but has also found nagging inconsistencies, not only across settings but also between campers' stated preferences and their actual behavior (Lee, 1977; Zuckert, 1980). Consequently there remain unresolved issues concerning campsite choice.

This thesis addresses some of those issues by re-examining previous research in light of recreation decision-making models that have been developed during the past decade (e.g., Krumpe and McLaughlin, 1982; Harris et al., 1985). A review of campsite-choice literature reveals recurring patterns in selection criteria. These patterns provide the basis for a three-stage, nested model of campsite choice. The model is similar to non-compensatory decision models developed by recreation researchers for examining broader questions of activity and setting choice, but contains an adjustment suggested by the work of economist Herbert Simon (1959).

Two tests of the model have been conducted. An initial test used data from a mail questionnaire administered to visitors of the Deschutes River State Scenic Waterway in central Oregon. The second test was part of a survey of visitors to the Enchantments area of the Alpine Lakes Wilderness in Washington. It was intended as a replication of the first study in a setting which offered more variability in campsite attributes, and also as a means of exploring issues that were raised by the Deschutes results.

A MODEL OF CAMPSITE CHOICE

Previous campsite selection research

Studies of campsite selection behavior have varied not only in the settings that have been examined, but also in the breadth of the examination and in the methods used. While some studies have been confined to specific site criteria (e.g., Foster and Jackson's (1979) study of preferences for screening vegetation between campsites), others examined the topic in considerable depth. Bumgardner et al. (1988) considered no fewer than 36 factors (not all of them site attributes) which might influence variability in use of campgrounds at Army Corps of Engineers reservoirs. Some researchers relied on observation, inventorying campsite attributes and recording which sites received the most use (Brown and Schomaker, 1974; Heberlein and Dunwiddie, 1979). Others used survey methods, asking campers directly which factors had influenced their choice (Harris, 1982; Clark et al., 1984). Still others combined both techniques (Lime, 1971; Bumgardner et al., 1988).

Table 1 summarizes the selection criteria identified in 10 campsite-choice studies conducted between 1964 and 1981 in eight widely dispersed settings. In a few cases, original site-attribute categories have been combined to allow comparisons. For example, Zuckert's (1980) criteria of "close enough" and "far enough" from a lake have been merged

TABLE 1
 Campsite choice criteria identified in previous studies

	California ^a	Oregon ^b	Minnesota ^c	Pacific NW ^d	Minnesota ^e	Wyoming ^f	Montana ^g	Oregon ^h
Level ground	*	*	*	*	*	*	*	
Shade/shelter	*	*	*	*	*		*	*
Near water	*	*	*	*		*	*	
Scenic beauty	*	*	*	*		*	*	
Size of campsite	*	*			*		*	*
Screened from others	*	*	*				*	*
Away from others	*	*		*		*		
"Improvements"	*	*			*	*		
Near trail	*	*					*	
Easy access	*			*	*			
Litter not present				*	*	*		
Little bare ground	*	*				*		
Trees present			*	*	*			
Firewood nearby			*	*	*			
Boat-landing area					*			*
Near fishing						*	*	
Near toilets			*					
Island					*			
Few insects						*		
Size of nearby stream								*

^aZuckert (1980)

^bHarris (1982)

^cLime (1971)

^dClark et al. (1984)

^ecombines Frissell and Duncan (1965) and Merriam and Smith (1974)

^fcombines Schomaker (1972) and Heberlein and Dunwiddie (1979)

^gBrown and Schomaker (1973)

^hpfister (1977)

to match other researchers' criterion of "distance to water." Although no attribute appeared in all eight settings, four were identified at least 75 percent of the time: level ground, distance to water, shade/shelter, and scenic beauty. These attributes may be important even in the settings where they were not listed as choice criteria. For example, the only studies where distance to water was not listed as a factor were those involving boaters, for whom water is always nearby. Similarly, level ground was not identified as a choice criterion among Rogue River boaters (Pfister, 1977) because only flat beachers were considered.

There are various reasons why other attributes appeared in fewer studies. Many are specific to certain types of settings, such as boating areas or developed campgrounds. A few can either attract or deter campers, depending on circumstances. For example, Shelby et al. (1988) found that small amounts of bare ground and unobtrusive fire rings tended to attract campers, but large bare spots and elaborate fire rings deterred them.

Selection criteria differ not only in the likelihood that campers will consider them, but also in the weight they receive in the evaluation process. Relative importance can be approximated by ranking the frequency with which each attribute is mentioned by respondents in a given setting. Table 2 gives this information for five settings where surveys were conducted and information about relative

TABLE 2
Relative importance of attributes in camper surveys

Attribute	California ^a	Oregon ^b	Minnesota ^c	Pacific NW ^d	Minnesota ^e	Avg. Rank
Island	f	f	f	f	1	1.0
Distance to water	1	5	1	1	1	2.0
Level ground	2	2	2 ^h	4	2	2.4
Space to land boats	f	f	f	f	4	4.0
Shade and/or shelter	4	3	4 ^h	8	5	4.8
Scenic beauty	7	1	10 ^g	5	10	6.6
Distance from others	6	4	10	3	10	6.6
Size of campsite	10	6	2 ^h	10	6	6.8
Firewood available	10	10	6 ^h	7	3	7.2
Near toilet facility	f	f	6 ^h	10	f	8.0
Ease of access	3	10	f	9	10	8.0
Presence of trees	10	10	9	2	10	8.2
Rustic improvements	5	8	f	10	10	8.3
Screened from others	10	10	4 ^h	10	10	8.8
Amount of litter	10	10	10	6	10	9.2
Amt. of bare ground	10	7	10	10	10	9.4
Familiarity with site	10	10	8	10	10	9.6

^aZuckert (1980)

^bHarris (1982)

^cLime (1971)

^dClark et al. (1984)

^eFrissell and Duncan (1985)

^fcircumstances prevented attribute's identification in this setting

^grank of 10 assigned where attribute was present but not identified

^htwo attributes ranked equally important in this setting

relative importance of site attributes was available. An importance score has been calculated for each attribute by averaging the ranks. Because no study used more than nine criteria, a rank of 10 has been assigned to attributes that were not identified where they were potentially present. Ranks have not been assigned where attributes could not be present, or where they might have been "too obvious" to mention (e.g., proximity to water in a boating area).

Five attributes scored noticeably higher than others: islands¹, distance to water, level ground, space for landing boats, and shade/shelter. A second group of attributes scored in the medium range: scenic beauty, distance from other parties, campsite size, and firewood availability. Screening between sites, though ranked somewhat lower, might be included in this category because of its high correlation with site separation and shade/shelter. The final group of attributes scoring 8.0 or above contains criteria that were not identified in settings where they might have been.

Common elements can be found within each group. The highest-ranking attributes tend to be those which are necessary to provide even a minimum-quality camping experience. Proximity to water is important for dispersed

¹The island criteria appears to represent a combination of attributes. It appears only in the Boundary Waters Canoe Area (Frissell and Duncan, 1965), where campers did not list such common criteria as distance to water, site separation and distance to water, all of which are offered by islands.

campers who cannot carry an adequate supply of drinking water. People who camp in tents or under the stars need flat ground for sleeping. Where sun, wind, or rain may cause discomfort, shade or shelter become necessities.

The second set contains attributes which, though perhaps not necessary to a minimum-quality experience, can be considered important contributors to a higher-quality experience. They are closely linked to the experience outcomes sought in outdoor environments. Campsites that are separated from other parties enhance the escape/solitude dimension of outdoor recreation (Stankey, 1973; Driver and Knopf, 1976). Similarly, scenic beauty can underscore the "naturalness" of outdoor settings which is often an important appeal of outdoor activities (Lucas, 1985). Firewood availability is also outcome-related, since campfires are usually considered part of the camping experience even by those who cook with stoves (Lucas, 1985).

The final category comprises what might be called "amenity attributes." Most campers do not consider these attributes very important, but may use them as "tie-breakers" if more than one site can provide a preferred experience.

Modeling campsite selection behavior

The next step in building a model of campsite choice is to fit these attributes into a decision-making framework.

Materials for this framework can be found in the growing body of research on recreation choice behavior. Most management strategies focus on the manipulation of setting attributes to offer certain experience opportunities. Researchers have examined choice-making behavior as they seek to understand the complex linkage between the recreation experience and its setting.

Much of this research is rooted in the expectancy-valence model of Ajzen and Fishbein (1980), which suggests that people engage in certain behaviors in the expectation that they will achieve specific kinds of satisfaction. Choice-making research examines how people decide which behaviors can produce the desired outcomes. The expectancy-valence approach, while providing a useful foundation, assumes that recreation choices are conscious and rational. This is not always so. Zuckert (1980) reported that many campers didn't seem to know why they had chosen their campsite, and had difficulty identifying site criteria when asked to do so.

Choices are rarely made by evaluating all criteria at once. Instead, decisions tend to occur in stages of increasing differentiation (Peterson et al., 1985). Krumpal and McLaughlin (1982) suggested that recreationists use an elimination-by-attributes (EBA) decision rule: A satisfaction threshold is set for each attribute, and alternatives failing to reach the threshold are

systematically rejected until just one choice remains. This process is "non-compensatory" in that alternatives failing to meet the minimum threshold for one attribute are not retained in the pool of choices no matter how high they score on other attributes. Watson and Roggenbuck (1985) suggest that recreation choice processes are not only non-compensatory but lexicographic: Alternatives are evaluated using an a priori hierarchy of attributes, and only those alternatives which score highest for each successive attribute are retained for evaluation on the next.

The campsite-choice studies suggest a nested decision model which can have either EBA or lexicographic properties, depending on the individual. A campsite has attributes such as flat ground, trees for shade and screening, a nearby stream, rocks for a fire ring, and so on. Campers already know which attributes they need, and which they want. When choosing among potential sites, they try to find the site containing the best combination of attributes. Research on choice behavior suggests that this evaluation occurs in three stages. During each stage, the pool of potential choices is narrowed as unsuitable or inferior sites are eliminated from further consideration.

The first of these stages focuses on "necessity attributes:" level ground, shade or shelter, nearby water, and other characteristics which supply basic camping needs. These attributes have been identified by nearly every

campsite choice study, although exact requirements may vary in accordance with group size, camping style and setting characteristics. For example, a Boy Scout troop is more likely to care about site size, while flat ground is more important for tent users than for RV campers using vehicles equipped with leveling jacks.

The second stage examines "experience attributes" which can enhance the overall experience: scenic beauty, site seclusion, firewood and so on. For campers who simply want to be in a non-urban setting, a beautiful view may be more important than a secluded site, while the reverse may be true for campers who seek solitude. If more than one alternative remains after the second stage, campers can move on to the third, ultimately basing the choice on an "amenity attribute" such as presence of a fire ring or trash barrel which serves mainly to increase the degree of comfort felt in camp.

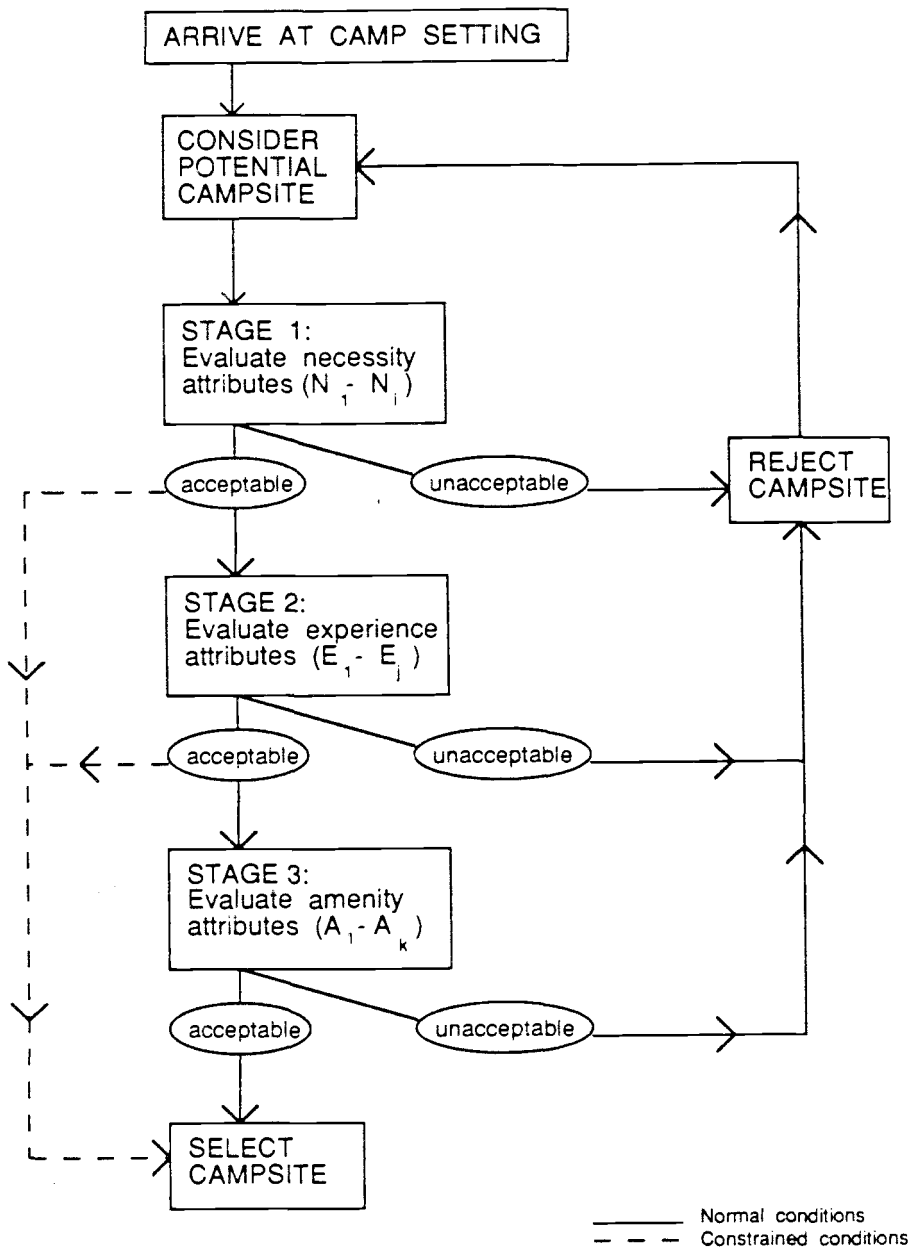
One additional factor must be considered in the model: Campers do not always choose campsites with the attributes they consider important. Lee (1977) found, for example, that a majority of backpackers in Yosemite National Park did not look for sites that were likely to provide the solitude they said they sought. Similarly, Foster and Jackson (1979) found no correlation between camper satisfaction and distance or screening between sites, even though respondents said those factors were important.

Most decision models assume that evaluators are aware of every choice and have unlimited time to reach a decision. However, recreation choices may be constrained in a number of ways. There may be compromises between group members with differing experience goals (Schreyer et al., 1985), or choices may be limited by incomplete information (Williams, 1985). Where sites are encountered serially rather than all at once, it may not be possible to know if better sites lie beyond. Campers may also feel pressure to choose quickly because of competition from other users, fatigue or threatening weather.

Simon (1959) considered the role of similar constraints in an economic context and concluded that when faced by even moderate uncertainty, people tend to abandon the quest for optimal solutions in favor of ones that can be considered good enough. He calls this adjustment process "satisficing." Campers are likely to satisfice in less-than-optimal situations as well. The campsite choice process can be aborted at any time after a site is found which reaches the minimum threshold for all necessity attributes. Thus experience attributes such as campsite solitude may not be evaluated despite their continued importance to the camper.

The complete model is summarized in schematic form in Fig. 1. Each potential campsite is evaluated as the camper encounters it. During Stage 1, the choice process is non-compensatory -- i.e., a site either offers the appropriate

Figure 1
Schematic Model of the Campsite-Choice Process



necessity attributes or it doesn't. Campers may use the EBA rule (if all sites reaching a minimum threshold for each attribute are retained as potential choices) or the lexicographic rule (if the choice is narrowed to the highest-ranking alternative(s) at each successive step. If the site is not acceptable, the camper will immediately continue to the next potential site and begin again.

If the site is acceptable at the end of Stage 1, the camper has two choices: proceeding to the second stage of the evaluation and reviewing the site for experience attributes, or opting simply to "satisfice" by choosing the campsite. If the former option is chosen, evaluation within the second stage can be either non-compensatory or compensatory -- i.e., campers may be willing to adjust the order of priority if a site offers an especially high level of an attribute that ordinarily might be considered less important. At the end of the second stage, the three original choices are faced again: rejection of the site, immediate acceptance of the site, or retention of the site in a pool of potential camp locations. The same choices are theoretically possible at the end of Stage 3, especially in settings where there is little or no competition and a relatively large number of potential sites. However, the likelihood of immediate acceptance increases at the end of each successive stage.

It should be noted that a non-compensatory hierarchical

model is truly applicable only to dispersed recreation sites. In developed recreation settings, Stage 1 evaluation may not take place because camping is usually limited to well-defined sites in which most necessities have been provided. While some camping parties may be forced to reject a site for lack of a necessity attribute, this usually only occurs when there is a special need such as an unusually large site or a site with electrical hook-ups. Many amenity attributes are also standardized in developed campgrounds. Each site may have a regulation-size picnic table, a fireplace with steel grate, and so forth. Therefore, evaluation of developed campsites tends to occur entirely within Stage 2, where recreationists can use either a compensatory or non-compensatory decision rule depending upon the circumstances and/or their own preference.

TESTING THE CAMPSITE MODEL

Research hypotheses

The model can be tested by asking campers to rate the importance of different campsite attributes and of the experience outcomes they seek from camping trips. The following hypotheses are suggested by the model:

HYPOTHESIS 1: Relative importance ratings for campsite attributes will follow this order: necessity, experience, amenity.

HYPOTHESIS 2: Experience attributes will be directly correlated with preferred experience outcomes -- e.g., solitude seekers will value distance between sites more highly than campers seeking a social experience.

HYPOTHESIS 3: Necessity attributes will not be highly correlated with experience outcomes, since these are minimum requirements for all users having certain characteristics.

If all three hypotheses are supported, the model can be said to truly reflect the behavior of campers in dispersed settings.

Overview of methods

Data for testing the model come from two studies of recreation behavior conducted by the Department of Forest Resources at Oregon State University. The initial test used data collected for a study of recreation use impacts on the

Deschutes River State Scenic Waterway (Shelby et al., 1987). This survey reached a large number of people who visited the Deschutes River during 1986 to boat, fish, picnic and camp. Although several different camping styles were represented, the setting does not offer as wide a variety of potential site attributes as might be found in other dispersed recreation settings.

Therefore, a second test was conducted using a survey of campers who had visited the Enchantments section of the Alpine Lakes Wilderness in central Washington during the summer of 1988. Although the primary purpose of the survey was to gather information pertaining to a hiking permit system, this test offered an additional advantage over the first in that the questionnaire was designed with the campsite model in mind. Not only did the setting offer a wider variety of campsite attributes, but questionnaire items were written specifically to address campsite-selection issues that were not covered by the Deschutes survey -- e.g., the role of proximity to water, and of variations in scenery. In each study, the same basic method was used to analyze campsite choice behavior. Two sets of Likert-type scales were presented on successive pages of the survey booklet. On one page, respondents were asked to use a five-point scale (1 = not important, 5 = extremely important) to rate the importance of various experience goals that may have influenced the decision to

visit the setting. On an adjacent page, respondents were asked to rate the importance of various campsite attributes using a four-point scale (1 = not important, 4 = very important).

Campsite attributes were classified by the researcher as necessity, experience or amenity attributes (or, in a few cases, dual-category attributes). Mean importance scores were calculated for each attribute. These scores provide a gauge of the relative importance of the various attributes in the selection process (see Hypothesis 1). Correlation coefficients were used to test for relationships between experience goals and campsite attributes (see Hypotheses 2 and 3). Statistical analysis was performed using the microcomputer program Statgraphics (Statistical Graphics Corp., 1987).

Because there were differences between the lists of experience goals and site attributes used in each survey, details on research methods are given in separate chapters covering each test of the model. These chapters include descriptions of the setting, details on survey sampling and scale items, results of the statistical analysis, and specific discussion of the results. A separate chapter contains a broader discussion of the findings as well as implications for further research.

TEST 1: DESCHUTES RIVER STATE SCENIC WATERWAY

The setting²

The 100-mile Deschutes River State Scenic Waterway begins below Pelton Dam near Warm Springs, Ore., and ends at the confluence with the Columbia River. The waterway is well-known for its scenery, whitewater boating, and fishing. Road access to the section immediately downstream from Pelton Dam is very limited. The primary recreational users of this section are people on overnight float trips, with a high proportion of trout anglers. Solitude-seeking campers often choose this section of the waterway. A 15-mile stretch above Sherar's Falls near the town of Maupin receives extremely heavy use, especially from whitewater rafting enthusiasts. This portion of the waterway, which is paralleled by a good road, is often called the "day use section" although there are some camping opportunities. Below Sherar's Falls the primary recreation activity is steelhead fishing.

The area has six developed campgrounds. Elsewhere users camp in undeveloped areas beside the river, and the Bureau of Land Management has inventoried 175 such campsites of varying quality. The terrain in the canyon is generally steep and rocky, but there are a number of flats and bars

²The first two sections of this chapter draw heavily on the M.S. thesis of Douglas Whittaker (1987), who was research assistant for the Deschutes River study.

along the river to provide camping spots. The climate in summer, when most recreation takes place, is quite hot. Railroad tracks follow the river for almost its entire length, and these are used daily for freight hauling. Livestock grazing is a major land use, and cattle may enter potential campsites. Although much of the land is owned by state or federal agencies, the waterway also includes some private land and is bordered by the Warm Springs Indian Reservation. Camping is prohibited on private and reservation lands.

Survey methods

The primary purpose of the Deschutes study was to identify the impacts of recreational use of the waterway, visitors' standards of acceptable impacts, and management strategies that might be used to keep impacts within acceptable levels. Separate questionnaires were administered to boaters and non-boaters. Boater names were randomly selected from a list of 13,000 people who purchased boater passes in 1985. Because one boater may purchase a pass for an entire party, this sample may be more likely to include trip leaders and commercial guides. The guide sample was analyzed separately to allow comparison of choice criteria used by casual and professional boaters.

Of 800 surveys mailed, 108 were undeliverable and 576 were returned -- an 83-percent response rate. Responses

came from 78 guides and 494 recreational users (with four surveys excluded because the respondents did not say if they were guides or recreational users). The sample of boaters who reported that they normally camp on Deschutes visits included 54 guides and 343 recreational boaters.

Non-boaters were sampled by contacting users on site and asking them to complete a short questionnaire which included space for their name and address. Of 251 surveys mailed to people contacted in this manner, one was undeliverable and 204 were returned, an 82-percent response rate. After the surveys were coded, 24 were removed from the sample because the respondents listed boating as their primary river activity. The final non-boater sample of 180 people included 133 who usually camp on their visits. More than 80 percent listed fishing as their primary activity.

The importance scale for experience goals listed 13 potential reasons for visiting the Deschutes, several of which were unlikely to be relevant to campsite choice (e.g., "The Deschutes is close to my home"). Reasons that were considered relevant to campsite choice included: "quality of trout fishing," "quality of steelhead fishing," "riverside camping," "getting together with friends," "peace and solitude," "getting away from other people," and "viewing scenery and wildlife." The last three can be considered escape-related, since each implies an active search for a non-urban environment.

The list of campsite attributes contained 11 items in the boater survey and 10 in the non-boater survey. The attributes in the boater survey were: "shade," "flat ground for tents," "good place to tie up boats," "has a toilet," "away from railroad tracks," "free of cattle grazing," "good fishing water nearby," "screening from other campsites," "out of sight and sound of others," "doesn't have much bare ground," and "free of fire hazards (no long grass)." The list for non-boaters did not include the boat tie-up item.

The campsite attributes can be categorized as follows:

Necessity attributes: flat ground, shade, good place to tie up boats (for boaters), has a toilet (for non-boaters).

Experience attributes: good fishing nearby, screening from other sites, out of sight and sound of others.

Amenity attributes: away from railroad tracks, free of cattle grazing, doesn't have much bare ground.

Toilet facilities and absence of long grass can be necessities or amenities, depending on the circumstances. While toilets may be a luxury for boaters in remote areas, they are probably a necessity for non-boaters, who camp in heavily used areas with road access. Fire protection may be a minor concern early in the year but a necessity in dry months, especially for campers who set up elaborate camps that cannot be dismantled quickly.

While both the relative importance and motive-attribute correlation analyses were performed on the data from non-

boaters and recreational boaters, no correlation analysis was done for guides. While the importance scores for campsite attributes should reflect guides' actual behavior, the scores for trip motives may not. The survey asked respondents to indicate how important each motive was to them "personally." However, guides' site selections may reflect professional considerations which might not coincide with their personal preferences for recreation outcomes.

Results

Mean importance scores for different campsite attributes are presented in Table 3. Scores for both boater groups generally followed the expected order. Among recreational boaters, necessity attributes scored highest, followed by the three experience attributes, both dual-category attributes, and finally the three amenity attributes. Guides, whose professional considerations may supersede their personal preferences, rated the attributes in a somewhat different order. Two necessity attributes were rated highest, followed by two experience attributes, the third necessity attribute, a dual-category attribute, the remaining experience attribute and the second dual-category attribute. Amenities again were ranked lowest.

Non-boaters valued an experience attribute, good fishing water, higher than any of the necessity attributes. Shade, a necessity attribute, was second, followed by four

TABLE 3
Importance scores for Deschutes campsite attributes^a

<u>NON-COMMERCIAL BOATERS</u>	<u>Mean Score</u>	<u>Attribute Type^b</u>
Flat ground for tents	3.25	N
Good place to tie up boats	2.69	N
Shade	2.64	N
Good fishing water nearby	2.60	E
Screening from other sites	2.41	E
Out of sight and sound of others	2.34	E
Has a toilet	2.33	N/A
Free of fire hazards (no long grass)	2.15	N/A
Free of cattle grazing	1.97	A
Doesn't have much bare ground	1.90	A
Away from railroad tracks	1.68	A
<u>COMMERCIAL GUIDES</u>		
Flat ground for tents	3.34	N
Shade	3.06	N
Screening from other sites	2.72	E
Good fishing water nearby	2.70	E
Good place to tie up boats	2.65	N
Free of fire hazards (no long grass)	2.62	N/A
Out of sight and sound of others	2.59	E
Has a toilet	2.49	N/A
Free of cattle grazing	2.06	A
Doesn't have much bare ground	1.94	A
Away from railroad tracks	1.67	A
<u>NON-BOATERS</u>		
Good fishing water nearby	3.29	E
Shade	2.97	N
Has a toilet	2.62	N
Flat ground for tents	2.61	N
Free of fire hazards (no long grass)	2.50	N/A
Screening from other sites	2.44	E
Out of sight and sound of others	2.17	E
Free of cattle grazing	2.04	A
Doesn't have much bare ground	1.87	A
Away from railroad tracks	1.81	A

^aMean responses from a four-point Likert-type scale

^bN = necessity attribute
E = experience attribute
A = amenity attribute

attributes of roughly equal value: flat ground, screening, toilets, and lack of fire hazards. All of these except screening can be considered necessities. Non-boaters placed more emphasis on toilets and fire safety than boaters, but less emphasis on campsites where other users can neither be seen nor heard. As with the boater groups, non-boaters put the least importance on amenity attributes.

Pearson product-moment correlations were used to test for links between campsite criteria and the preferred experience outcomes. Correlations between recreation motives and experience attributes are presented in Table 4 (recreational boaters) and Table 5 (non-boaters). Table 4 shows a strong link between quality fishing as an outcome and the desire to find campsites near good fishing ($R=.73$ for steelhead anglers, $.60$ for trout anglers). It also shows significant correlations between the escape-related motives (getting away from others, peace and solitude, and viewing scenery and wildlife) and desire to find for campsites that are screened or distant from other sites. In this group, correlation coefficients are higher for the relationship between "getting away from others" and solitude-enhancing campsite attributes ($R=.41$ for screening, $.44$ for distance) than for "peace and solitude" or "viewing scenery and wildlife." All six correlations are $.25$ or more.

One experience-attribute correlation was not predicted: the link between campsites near fishing spots and the

TABLE 4
Correlation of experience attributes with boater motives

MOTIVES	Near <u>fishing</u>	ATTRIBUTES <u>Screened</u>	Out of
<u>sight/sound</u>			
Quality of trout fishing	.59*	.18	.18
Quality of steelhead fishing	.73*	.03	.05
Riverside camping	-.11	.08	.00
Socializing with friends	-.15	.03	.07
Peace and solitude	.12	.37*	.36*
Getting away from others	.21*	.41*	.44*
Viewing scenery/wildlife	.13	.26*	.25*

*Significant at $p < .0001$

TABLE 5
Correlation of experience attributes with non-boater motives

MOTIVES	Near <u>fishing</u>	ATTRIBUTES <u>Screened</u>	Out of
<u>sight/sound</u>			
Quality of trout fishing	.33*	.12	.17
Quality of steelhead fishing	.44*	-.07	-.06
Riverside camping	-.02	.21*	.21*
Socializing with friends	-.04	.06	-.07
Peace and solitude	.00	.51*	.47*
Getting away from others	.04	.54*	.60*
Viewing scenery/wildlife	.00	.29*	.22*

*Significant at $p < .02$

"getting away from others" outcome. This result can be traced to an underlying relationship between trout fishing and escape motives. The best trout fishing is found in a remote part of the study area, and many trout anglers also seek escape ($R=.27$). There was no correlation ($R=.09$, $p>.05$) between escape motives and campsites near fishing spots for the 183 boaters who are not trout anglers.

As predicted, analysis of the non-boater survey also showed significant correlations between fishing as an experience outcome and the desire to find campsites near good fishing spots, although the coefficients were smaller for boaters ($R=.33$ for trout anglers, $R=.44$ for steelhead anglers). The correlations between "getting away from others" and "peace and solitude" as experience outcomes and solitude-enhancing campsite attributes are higher, ranging from .47 to .60. Correlations between "viewing scenery and wildlife" and solitude-enhancing campsite attributes are lower ($R=.29$ for screening between sites, $R=.22$ for being out of sight or sound of other sites.) Unlike boaters, non-boaters who value camping for its own sake also tended to value solitude-enhancing attributes ($R=.21$).

The correlation analyses for necessity attributes are presented in Table 6 (boaters) and Table 7 (non-boaters). It had been predicted that there would be no correlation between experience outcomes and necessity attributes. In fact, analysis of 56 motive/attribute combinations found two

TABLE 6
Correlation of necessity attributes with boater motives

MOTIVES	ATTRIBUTES			
	<u>Shade</u>	<u>Flat ground</u>	<u>Boat tie-ups</u>	<u>No long grass</u>
Quality of trout fishing	.01	-.06	-.08	-.03
Quality of steelhead fishing	.12	-.09	-.09	-.03
Riverside camping	.13	.19	.22*	.19
Socializing with friends	-.05	.02	.17	.08
Peace and solitude	.01	.07	.16	.05
Getting away from others	.06	.04	.14	.04
Viewing scenery/wildlife	.04	-.01	.13	.04

*Significant at $p < .0001$

TABLE 7
Correlation of necessity attributes with non-boater motives

MOTIVES	ATTRIBUTES			
	<u>Shade</u>	<u>Flat ground</u>	<u>Has a toilet</u>	<u>No long grass</u>
Quality of trout fishing	.06	.02	.01	.01
Quality of steelhead fishing	-.04	-.00	-.03	.06
Riverside camping	.04	.02	.13	.03
Socializing with friends	.06	.15	.29*	.06
Peace and solitude	.18	.16	-.03	.03
Getting away from others	.05	.17	-.09	-.08
Viewing scenery/wildlife	.16	.14	-.08	-.04

*Significant at $p < .02$

correlations. Boaters who placed a high value on camping also tended to seek campsites with a good boat tie-up area ($R=.22$). Non-boaters tended to prefer campsites with toilets if they were seeking a social recreation experience.

Discussion

Hypothesis 1 predicted that campers would consider necessity attributes to be most important, followed by experience attributes and finally amenity attributes. Results from the two boater samples offer strong support for this contention, while the non-boater survey provides more qualified support.

The importance scores of recreational boaters exactly followed the predicted hierarchy of attribute types. Scores for guides were somewhat different. Two necessities (flat ground and shade) were rated highest, and amenities ranked lowest. However, the stratification of attribute types was less distinct for attributes of intermediate importance. This result can be attributed largely to business factors. Guides may prefer sites that are screened from other parties because an appearance of isolation can heighten the image of expedition and adventure that their customers are buying. The added emphasis on avoiding fire hazards is not surprising since the peak outfitting season is also the peak fire season. Conversely, guides may put less emphasis on boat landings because that criterion is not likely to affect their customers' satisfaction.

The basic order of importance was the same in the non-boater survey, but with one exception: good fishing water (an experience attribute) was rated higher than any of the necessity attributes. This result was not predicted by the model. Two alternative hypotheses can explain the apparent discrepancy: (1) experience attributes are sometimes more important than necessity attributes, or (2) the "necessities" can differ for different types of campers.

The first explanation suggests the use of a compensatory decision rule where the presence of a highly valued non-necessity (high-quality fishing) can compensate for the absence of attributes normally thought of as necessities. If so, the non-compensatory model is flawed. The second explanation is true if non-boaters don't always have the same set of necessities as boaters, or if an experience outcome can be so highly valued that it is as important to campers as achieving a minimally acceptable level of camping comfort. Many non-boaters camp in developed campgrounds, where the presence of some campsite attributes can be automatically assumed (Lime, 1971). As a result, necessity attributes are less likely to be involved in the choice process. In addition, nearly half of the sample used recreational vehicles, which can be parked on sites that are unsuitable for tents and which are more resistant to heat and wind (Clark et al., 1984). If RV users are excluded, the mean importance score for flat

ground rises from 2.61 to 3.20, and the score for shade rises from 2.97 to 3.19. While these scores are almost as high as the one for good fishing (3.30), it nonetheless appears that for non-boaters -- 80 percent of whom are anglers -- proximity to good fishing is indeed as much a necessity as even the barest camp comforts.

Hypothesis 2 predicted that people seeking a particular type of recreation experience will look for campsites which help them achieve that experience. The correlations between experience attributes and trip motives offer support for this hypothesis. Campers who are also anglers are more likely to seek campsites near good fishing water, and campers who value escape-related outcomes are more likely to seek campsites that are screened and/or distant from other sites.

For boaters, the link between angling as an outcome and campsites near fishing water is stronger than the link between escape motives and campsite separation. The reverse is true among non-boaters. The strength of the correlation varies inversely with the ease of achieving the outcome. Boating anglers, because they cannot float upstream, cannot move easily from their camp to many of the best fishing spots and so they tend to place a stronger emphasis on sites near good fishing water. Escape is easier to achieve on a boat trip since the river affords access to campsites which cannot be reached by road. Non-boaters who seek escape must

put more emphasis on finding the scarce sites that offer both seclusion and motor-vehicle access.

Three correlations were not predicted by Hypothesis 2, but they do not necessarily cast doubt on the hypothesis. The correlation between "good fishing water nearby" and "getting away from others" is explained by the fact that trout anglers tend also to seek escape. This escape-angling link has been identified in previous studies (Driver and Knopf, 1976).

The other unpredicted correlations involved non-boaters who value camping as an experience goal and also consider solitude-enhancing site attributes important. Since campsite environments offer incongruity from urban settings, "good camping" may be closely related to solitude-seeking. Car campers are no less likely to value privacy (Twight et al., 1981), but in the crowded Deschutes waterway privacy may be more elusive for non-boaters than for boaters.

Hypothesis 3 predicted that necessity attributes, being of universal importance, would not be correlated with any recreation motive. This hypothesis is supported. Fifty-four of 56 possible correlations were non-significant. The two exceptions can be explained. Non-boaters seeking a social experience tended to prefer campsites with toilets ($R=.29$). This group was also more likely to visit the section of the study area where privacy is limited by heavy recreational use and a good road following the river. The

other motive-necessity correlation, between camping as a motive and campsites with boat tie-ups, makes sense if, as seems likely, avid campers spend more time in camp and off the river.

TEST 2: THE ENCHANTMENTS

The Deschutes River study offered support for the campsite-choice framework, but it could not answer all of the questions raised by the literature review. The river canyon setting tended to restrict campers' options to sites that were adjacent to the river. Two of the campsite attributes mentioned most frequently in previous studies -- distance to water and scenic beauty -- do not vary enough within the waterway to be considered variables for campsite selection.³ Therefore a second test of the model was undertaken in a setting that would offer more variability in site attributes.

The setting

The Enchantments is a popular hiking and camping destination located in the Alpine Lakes Wilderness southwest of Leavenworth, Wash. The area lies 6,000-9,500 feet above sea level, and its use season is relatively short, lasting roughly from early June until early November. Permits are required for entry between June 15 and Oct. 15. An unlimited number of day-use permits are issued. However, overnight camping is limited by the Wenatchee National Forest, and visitors wish to camp at four popular destinations within the Enchantments must apply in advance

³Appendix A contains a discussion of some of the factors which influence scenic preferences for campsites, as well as the multiple meanings of water in campsite choice behavior.

for a permit. Besides hiking and camping, other popular recreational activities include fishing, hunting, nature study and climbing (both rock and alpine).

There are no restrictions on campsite locations for those who receive camping permits. Most campers choose sites near one of several lakes in the area. Campsites at Stuart, Snow and Colchuck lakes generally offer some shade or screening vegetation. Sites in the "Enchantments core," a high-elevation plateau surrounded by granitic peaks and studded with tiny glacially carved lakes, are above timberline. Toilet facilities have been provided at some of the most popular campsite locations.

Survey methods

The Enchantments survey was commissioned by the USDA Forest Service, which was seeking information about users' views of the wilderness management system in the area. Of special interest were users' perceptions of recreation use impacts, and information about how the permit system has affected use of the Enchantments and of other wilderness areas in the Pacific Northwest. The sample came from a list of names provided by the Forest Service. It included all 1988 permit applicants, plus other visitors who had made their trips before the start of the permit season or who had been issued citations for failing to obtain permits before their visits.

An initial sample of 50 people was used to pre-test the questionnaire. After slight revisions, the final survey was mailed to 485 people. Three separate mailings were used, following the strategy outlined by Dillman (1978). Twenty-nine surveys were returned as undeliverable. Of the surveys remaining, 388 were returned, for a response rate of 85.1 percent. The campsite analysis used a subset of 345 respondents who had visited the Enchantments during 1988.

Eighteen items were listed on the importance scale of reasons for visiting the Enchantments. As in the previous test, some of these were excluded from the campsite study because they were not likely to affect site choice. The experience goals used for this analysis were: "enjoying good camping," "meeting other people," "getting together with family/friends," "enjoying good fishing/hunting," "doing classic climbs," "getting away from others," "seeing wildlife," "exhilarating scenery," and "relaxing, getting away from it all." The wording of the last three items was intended to discriminate between escape motives more clearly than the analogous items from the Deschutes study: "viewing scenery and wildlife" and "peace and solitude."

The list of campsite attributes included 20 items. These attributes were classified as follows:

Necessity attributes: Flat area for tents, sheltered from wind and rain, close to drinking water, dry and well-drained.

Experience attributes: Out of sight and sound of others, good view of mountains, screening from other campsites, good view of lake(s), good view of stream, close to good fishing, close to other campers, no evidence of prior use (fire ring, litter).

Amenity attributes: Gets morning sun, gets evening sun, doesn't have much bare ground, close to toilets, shade, close to trail, improvements (fire ring, seating).

The remaining attribute, "close to climbing routes," is somewhat problematic. It seems to best fit the definition of an experience attribute, since it is likely to be sought in order to enhance campers' ability to achieve a particular experience goal. However, for alpinists climbing some Enchantments peaks, it is a necessity to be close to climbing routes because the entire day will be required to reach the summit and return before dark.

The no-evidence-of-prior-use criterion, though included with the experience attributes, could almost as easily be classified as an amenity attribute. Even if considerable amounts of trash or other traces of civilization are present at a site, these usually can be obliterated easily. However, it is also true that their presence can interfere with goals of escaping civilized pressures and achieving a relationship with nature, which have been identified as the most important motives for wilderness travel (Brown and Haas, 1980).

Hypotheses 2 and 3 were the same as in the Deschutes study: It was predicted that experience attributes would be correlated with trip motives, but that necessity attributes would not be. However, it was necessary to define Hypothesis 1 slightly more loosely than before. Because the list of campsite attributes was so long, and included some attributes which were relevant for only a small percentage of users, it was unlikely that the order would be followed exactly. Rather we could expect little-needed experience attributes to rank lower than some amenity attributes. However, we could still expect that necessity attributes would have the highest scores, and that experience attributes would tend to rank higher than amenity attributes.

Results

Mean importance scores for campsite attributes are shown in Table 8. Two necessity attributes, flat ground and dry ground, were ranked highest. A cluster of four attributes were rated slightly lower: (in order) distance between sites, mountain vistas, proximity to drinking water and screening between sites. This group includes one necessity attribute (close to drinking water) and three experience attributes. The remaining necessity attribute, shelter from bad weather, ranked somewhat lower.

Mean scores for the 12 remaining attributes fell below

TABLE 8
Importance scores for Enchantments campsite attributes^a

	Mean <u>score</u>	Attribute <u>type</u> ^b
Flat area for tents	2.93	N
Dry and well-drained	2.93	N
Out of sight and sound of others	2.85	E
Good view of mountains	2.83	E
Close to drinking water	2.81	N
Screening from other campsites	2.81	E
Sheltered from wind and rain	2.58	N
Good view of lake(s)	2.55	E
No evidence of prior use (fire ring, litter)	2.29	E
Gets morning sun	2.10	A
Gets evening sun	2.00	A
Good view of stream	1.86	E
Close to climbing routes	1.78	E/N
Doesn't have much bare ground	1.70	A
Close to toilets	1.55	A
Shade	1.50	A
Close to good fishing	1.49	E
Close to trail	1.48	A
Improvements (fire ring, seating)	1.47	A
Close to other campers	1.11	E

^aMean responses from a four-point Likert-type scale

^bN = necessity attribute

E = experience attribute

A = amenity attribute

2.50, the halfway point between "not important" and "very important." This group included all amenity attributes, plus three experience attributes which apply to very specific groups of campers, and "no evidence of prior use."

The Deschutes study suggested that activity and camping style could affect the relative importance of campsite attributes. To test the possibility that this phenomenon had caused deviations from the predicted order of attribute importance in the Enchantments, mean importance scores were obtained for three subsets of 1988 Enchantments visitors.

The survey asked respondents to choose a "primary recreational activity" from a list of nine choices: "wilderness camping," "mountain/alpine climbing," "rock climbing," "backcountry hiking," "nature study," "fishing," "bow hunting," "hunting (with rifle)," and "photography." The frequency distribution of responses is shown in Table 9. The first four categories were checked by 87.1 percent of respondents. Only 3.2 percent of the respondents called themselves anglers, suggesting that the experience attribute "close to good fishing" would rank quite low compared to the Deschutes, where fishing was a prime attraction.

By combining alpinists and rock climbers into a single "climber" category, it was possible to create three categories large enough to provide a meaningful analysis of the effect of activity on relative attribute importance. The scores for these groups are shown in Tables 10-12.

TABLE 9
 Primary recreational activities of Enchantments visitors

<u>Activity</u>	<u>N</u>	<u>Pct</u>
Wilderness camping	94	27.2
Mountain/alpine climbing	55	15.9
Rock climbing	25	7.2
Backcountry hiking	127	36.8
Nature study	1	0.3
Fishing	11	3.2
Bow hunting	0	-0-
Hunting (with rifle)	2	0.6
Photography	10	2.9
DID NOT ANSWER	20	5.8

TABLE 10
Attribute importance scores for campers^a

	Mean <u>score</u>	Attribute <u>type</u> ^b
Out of sight and sound of others	3.20	E
Screening from other campsites	3.20	E
Flat area for tents	3.12	N
Dry and well-drained	3.03	N
Good view of mountains	2.99	E
Close to drinking water	2.90	N
Good view of lake(s)	2.81	E
No evidence of prior use (fire ring, litter)	2.55	E
Sheltered from wind and rain	2.52	N
Good view of stream	2.22	E
Gets morning sun	2.14	A
Gets evening sun	1.96	A
Doesn't have much bare ground	1.83	A
Shade	1.64	A
Improvements (fire ring, seating)	1.60	A
Close to good fishing	1.56	E
Close to trail	1.55	A
Close to other campers	1.54	E
Close to climbing routes	1.54	E
Close to toilets	1.46	A

^aMean responses from a four-point Likert-type scale

^bN = necessity attribute

E = experience attribute

A = amenity attribute

TABLE 11
Attribute importance scores for climbers^a

	Mean <u>score</u>	Attribute <u>type</u> ^b
Good view of mountains	3.00	E
Close to drinking water	2.94	N
Close to climbing routes	2.91	N
Dry and well-drained	2.90	N
Out of sight and sound of others	2.67	E
Flat area for tents	2.64	N
Sheltered from wind and rain	2.63	N
Screening from other campsites	2.51	E
No evidence of prior use (fire ring, litter)	2.30	E
Good view of lake(s)	2.16	E
Gets morning sun	1.95	A
Gets evening sun	1.91	A
Doesn't have much bare ground	1.74	A
Good view of stream	1.56	E
Close to other campers	1.49	E
Shade	1.45	A
Close to trail	1.44	A
Close to toilets	1.40	A
Improvements (fire ring, seating)	1.18	A
Close to good fishing	1.15	E

^aMean responses from a four-point Likert-type scale

^bN = necessity attribute

E = experience attribute

A = amenity attribute

TABLE 12
Attribute importance scores for hikers^a

	Mean <u>score</u>	Attribute <u>type</u> ^b
Flat area for tents	3.21	N
Dry and well-drained	3.05	N
Out of sight and sound of others	3.00	E
Screening from other campsites	2.97	E
Close to drinking water	2.87	N
Good view of mountains	2.83	E
Good view of lake(s)	2.78	E
Sheltered from wind and rain	2.76	N
No evidence of prior use (fire ring, litter)	2.35	E
Gets morning sun	2.29	A
Gets evening sun	2.23	A
Good view of stream	2.03	E
Close to other campers	1.82	E
Close to toilets	1.79	A
Doesn't have much bare ground	1.73	A
Improvements (fire ring, seating)	1.66	A
Close to good fishing	1.65	E
Shade	1.64	A
Close to trail	1.55	A
Close to climbing routes	1.48	A

^aMean responses from a four-point Likert-type scale

^bN = necessity attribute
E = experience attribute
A = amenity attribute

This analysis shows even more deviation from the predicted order of importance. For those who said their primary activity was camping (Table 10), two experience attributes were most important: screening and distance between sites. Three of the next four attributes were necessities, but the final necessity attribute scored lower than lake views or "no evidence of prior use." Of the 10 least important attributes, eight were amenities and the other two were experience attributes connected with uncommon trip motives (fishing and meeting other people).

For climbers (Table 11), an experience attribute ("good view of mountains") was most important, but five of the next six highest scores were for necessity attributes. Distance between sites, an experience attribute, was rated as highly as the necessity attributes. The high score for "close to climbing routes" supports the prediction that this would be a necessity for many climbers. All amenity attributes scored below 2.0, as did three experience attributes.

Hikers (Table 12) were the largest group, and their relative importance scores most closely resembled those of the sample as a whole. Flat ground and dry ground ranked highest, followed by the two site-isolation attributes, proximity to drinking water, two of the scenery attributes and shelter from wind and rain. As with the other groups, proximity to fishing, stream views and proximity to other campers ranked on a par with most amenity attributes.

TABLE 13
Correlation of experience attributes with trip motives

MOTIVE	ATTRIBUTE				
	Between sites ... <u>Distance</u>	<u>Screening</u>	<u>Mtns.</u>	<u>Lake(s)</u>	<u>Stream</u>
Exhilarating scenery	.12	.10	.22*	.19	.08
Relaxing	.17	.20	.20*	.27*	.22*
Get away from others	.35*	.29*	.14	.08	.14
Enjoying good camping	.21*	.21*	.26*	.28*	.29*
Seeing wildlife	.16	.20*	.21*	.18	.33*
Be with family/friends	-.02	-.00	.08	.12	.17
Doing classic climbs	-.10	-.20*	.07	-.29*	-.17
Good hunting/fishing	.10	.18	-.01	.17	.04
Meeting other people	-.16	.12	.06	.15	-.01

	Is close to ...		
	<u>Climbs</u>	<u>Fishing</u>	<u>Campers</u>
Exhilarating scenery	-.07	-.01	-.02
Relaxing	-.06	.27*	.05
Get away from others	.03	.14	-.06
Enjoying good camping	-.13	.23*	.02
Seeing wildlife	-.01	.22*	.06
Be with family/friends	.01	.09	.07
Doing classic climbs	.75*	-.15	.08
Good hunting/fishing	-.14	.82*	.16
Meeting other people	.04	.03	.23*

*Significant at $p < .0005$

TABLE 13
Correlation of experience attributes with trip motives

MOTIVE	ATTRIBUTE				
		Between sites ...		Offers view of	
...		<u>Distance</u>	<u>Screening</u>	<u>Mtns.</u>	<u>Lake(s)</u>
<u>Stream</u>	Exhilarating scenery	.12	.10	.22*	.19
.08	Relaxing	.17	.20*	.20*	.27*
.22*					
Get away from others		.35*	.29*	.14	.08
Enjoying good camping		.21*	.21*	.26*	.28*
Seeing wildlife		.16	.20*	.21*	.18
Be with family/friends		-.02	-.00	.08	.12
Doing classic climbs		-.10	-.20*	.07	-.29*
Good hunting/fishing		.10	.18	-.01	.17
Meeting other people		-.16	.12	.06	.15

	Is close to ...		
	<u>Climbs</u>	<u>Fishing</u>	<u>Campers</u>
Exhilarating scenery	-.07	-.01	-.02
Relaxing	-.06	.27*	.05
Get away from others	.03	.14	-.06
Enjoying good camping	-.13	.23*	.02
Seeing wildlife	-.01	.22*	.06
Be with family/friends	.01	.09	.07
Doing classic climbs	.75*	-.15	.08
Good hunting/fishing	-.14	.82*	.16
Meeting other people	.04	.03	.23*

*Significant at $p < .0005$

One other experience goal, getting together with family/friends was included for comparability with the Deschutes study. No significant correlations were expected.

Of the 23 predicted correlations, 18 were found. Five others did not appear, while there were five correlations which were significant although not predicted. The predicted correlations which did not occur were: scenery/lake view; scenery/stream view; relaxation/site distance; wildlife/site distance; and wildlife/lake view. Unpredicted correlations were: fishing/relaxation; camping/fishing; wildlife/fishing; climbing/screening and climbing/lake view.

Table 14 shows the correlations between trip motive and necessity attributes. Two correlations were significant. Campers who want to relax tended to place more emphasis on sites near drinking water, and climbers were less likely to consider flat ground important.

Discussion

This test of the campsite model was intended as a replication of the Deschutes test in a setting where the range of choices was broader and, therefore, the likelihood of the model's failure was somewhat greater. In fact, the results were not unlike those of the first test, showing some of the same support for the model but also running afoul of the same problems.

TABLE 14
Correlation of necessity attributes with trip motives

	<u>Flat</u> <u>ground</u>	<u>Dry</u>	<u>Drinking</u> <u>water</u>	<u>Shelter</u>
Exhilarating scenery	.10	.07	.10	.09
Relaxing	.07	.12	.20*	.15
Get away from others	-.04	.06	.06	.07
Good camping	.12	.08	.15	.13
Seeing wildlife	.04	.06	.18	.10
Be with family/friends	.11	.03	.08	.09
Doing classic climbs	-.28*	.12	.04	-.05
Good fishing/hunting	.05	.02	.02	.08
Meeting other people	.07	.01	.04	.01

* Significant at $p < .0005$

Hypothesis 1, which predicted the order of importance of the various site attributes, received qualified support. As expected, necessity attributes tended to have the highest mean importance scores. However, a few experience attributes ranked as high, or higher. This was particularly true when the importance ratings were examined for members of activity-specific subgroups of the Enchantments user population.

The Deschutes results suggested that one reason for discrepancies between the predicted and measured order of importance may be that experience goals can be so important that achieving them becomes necessary for even minimal trip satisfaction. The same explanation fits the results here. Two of the three most highly rated experience attributes -- distance between sites and screening between sites -- are ones which can enhance the experience goals of escape and solitude. Enchantments visitors have chosen to take the time and trouble required to apply for a camping permit, and in return they expect to gain the increased opportunity for solitude which is the goal of the permit system. Had they put less value on solitude, they might have opted simply to visit a nearby wilderness where permits are not required.

People who considered "wilderness camping" their primary Enchantments activity rated site distance and screening higher than any other campsite attribute. Those whose main activity was "backcountry hiking" ranked the

site-isolation attributes slightly lower, although still important. This is consistent with previous findings that wilderness users are more sensitive to contacts with other visitors in camp than on the trail (Stankey, 1973; Lucas, 1985). It is likely that "campers" plan to spend more time at the campsite and less on the trail; therefore they may have more incentive to seek isolation from other visitors.

The other highly rated experience attribute, "good view of mountains," is important for a slightly different reason. Spectacular mountain scenery is what sets the Enchantments apart from other wilderness areas, and "exhilarating scenery" was by far the most important trip motive for visitors (Table 15), scoring 4.52 on a five-point scale. But for alpinists, a mountain view has an added benefit -- it allows climbers to compare a route described in a guidebook with features they can see from camp. If the mountain cannot be seen, it is nearly impossible to plan the next day's climb. Thus a mountain view may be a virtual necessity for this group.

Hypothesis 2 predicted that importance scores for experience attributes would be positively correlated with the corresponding experience goals. This occurred in most cases, but some discrepancies were found. As expected, people who wanted to experience "exhilarating scenery" also wanted a good view of mountains. But they were no more likely to seek good views of lakes or streams, perhaps

TABLE 15
Importance scores for Enchantments trip motives^a

	<u>Mean score</u>
Exhilarating scenery	4.52
Pristine environment	4.21
Being physically active; getting exercise	4.09
Enjoying good hiking	3.96
Relaxing, getting away from it all	3.90
Getting away from other people	3.66
Clean water	3.59
Enjoying good camping	3.51
Good weather	3.48
Secluded campsites	3.35
Being self-reliant	3.19
Seeing wildlife	3.10
Getting together with family/friends	3.00
Studying nature	2.90
Doing classic climbs	2.32
Chancing dangerous situations	2.14
Enjoying good fishing/hunting	1.87
Meeting other people	1.62

^aMean responses from a five-point Likert-type scale

because mountains are the main scenic attraction of the Enchantments while similar lake and stream vistas are easily found elsewhere.

The goals of "relaxing; getting away from it all" and "enjoying good camping" were expected to be correlated with both site-isolation attributes and all three views. This prediction held true for the "good camping" motive and mostly true for the "relaxation" motive. However, it appears that distance from other campsites is not necessary for people in the latter group if they can find sites that block their view of other visitors. Both motives were also linked with the attribute "close to good fishing." This may be related to the fact that visitors whose primary activity was camping spent an average of one day longer in the Enchantments than either hikers or climbers. Thus they have more time for a wider variety of backcountry activities, including fishing.

The same set of correlations was predicted for people who wanted to see wildlife while on their Enchantments trip. The expected relationships were found for screening, mountain views and stream views, but not for lake views or distance between sites. Since wildlife is most abundant where trees are present, people wanting to see wildlife may tend to camp below timberline where vegetation provides all the isolation needed. Although lake views are not any more important to this group, nearly all lower-elevation sites

are on or near the larger lakes. This is also where fishing is best, which may explain the unpredicted correlation between wildlife watching as a motive and campsites near good fishing.

As predicted, visitors who consider "getting away from other people" to be important tended to seek site-isolation attributes, while people who consider "meeting other people" important tended to look for campsites near other campers. Also as expected, none of the site attributes was correlated with the motive "getting together with family/friends."

The activity motives, fishing/hunting and climbing, were very highly correlated with attributes which put visitors nearer the sites of those activities. This is consistent with the findings of Heberlein and Dunwiddie (1979), who reported that fishermen in the Bridger Wilderness of Wyoming tended to camp closer to lakes while climbers camped closer to the mountains. Climbing as a motive was also negatively correlated with screened sites and lake views. These relationships probably reflect the relative scarcity of lakes and screening vegetation at higher elevations.

Hypothesis 3 predicted that necessity attributes would not be correlated with experience goals since they pertain to aspects of camping which are common to all visitors. Yet the mean importance scores suggest that some necessity attributes aren't always necessities. An example is

shelter. While many visitors to the Enchantments may consider shelter a pre-requisite for a minimally satisfactory experience, especially when weather conditions are less than optimal, others prefer to camp above timberline where shelter from the elements is virtually non-existent.

A related issue is the significant negative correlation between "doing classic climbs" as a motive and the necessity attribute "flat area for tents." As a group, climbers rated this attribute much lower than campers or hikers ($F=11.31$, $p<.0001$). The reason may be found in the words "... for tents." Because they must also carry heavy ropes and metal climbing gear, alpinists often do not carry tents at all. Their flat ground needs are therefore limited to the space required for a sleeping bag or bivouac sack.

One other significant necessity-motive correlation was found among the 36 tested: People who placed a high value on "relaxing; getting away from it all" were more likely to seek a site near drinking water. As was noted earlier, this group tended to take longer trips than other visitors. Therefore they are likely to need to replenish their water supply more often, and may prefer not to have to walk too far to do so.

CONCLUSION: IMPROVEMENTS AND IMPLICATIONS

Many researchers have identified factors which are considered by campers when choosing among alternative recreation sites. This thesis describes an attempt to construct a model of the process by which these factors are evaluated, using a framework suggested by the recreation choice studies of Krumpke and McLaughlin (1982) and Harris et al. (1985).

Two separate studies have offered some support for the model, but the results have left some questions unanswered. It seems clear that campers tend to consider site attributes to be most important if they meet the basic needs for a minimally acceptable camping experience. There is strong evidence that many of the features people look for in a campsite are linked to the non-camping goals they hope to achieve during their trips. There is evidence, too, that these "experience attributes" are somewhat less important than the bare camping necessities, but more important than those features which serve mainly to provide a slightly greater degree of comfort while in camp.

Nonetheless, attempts to define universally recognized necessity, experience or amenity attributes have not been entirely successful. The exceptions to Hypothesis 3 (which predicted that necessity attributes are unrelated to trip motives), though relatively rare, showed that necessities

may vary from camper to camper. In the Enchantments, climbers don't seem to need as much flat ground as other visitors do. On the Deschutes, campers who use RVs can choose sites which don't provide the necessities for tent campers, and guides have different boat tie-up needs than non-commercial boaters.

Necessities also can be setting-specific, especially those related to climate. Shade was a highly rated necessity in the Deschutes canyon, but an amenity in the Enchantments. Shelter in the Enchantments occupied a kind of medium level of importance, on a par with experience attributes yet unrelated to any experience goals. Perhaps people who camp above timberline bring all their shelter needs with them. Or perhaps shelter is a necessity where one expects to be able to find it -- i.e., below timberline -- but an amenity at higher elevations where it is rare.

It seems that campers adjust their campsite selection behavior to fit the circumstances. Just as expectations for use densities affect how crowded people feel at a recreation site (Shelby and Heberlein, 1986), expectations for campsite conditions may affect users' site requirements. If the model described here is to be useful in guiding decisions about dispersed recreation settings, managers must understand what users' expectations are for each setting. For example, although shelter does not seem to be a necessity in the Enchantments, it may be one in other

settings -- even if those settings are very similar to the Enchantments.

A second issue related to attribute classification is that of experience attributes that become necessities. The evidence gathered during both tests of the campsite model pointed to the existence of such "necessary experience attributes." In both tests, these attributes were linked to experience goals for which the setting was especially known. On the Deschutes River, a world-renowned fishing stream, there were campers who valued fishing so highly that they wouldn't consider camping at a location that didn't offer the opportunity to fish. In the Enchantments, where special efforts have been made to reduce camper densities and thus ensure opportunities for solitude, people who place a high value on solitude say that's the most important attribute of a campsite.

It is not difficult to imagine a situation where the physical necessities aren't enough. A photographer hoping to shoot a spectacular sunset might easily decide, upon arriving at the destination, not to camp in an otherwise serviceable site if the view is blocked by the tents of a Boy Scout troop. The desire to take that "perfect photograph" might easily prompt a decision to seek out the next best unblocked vantage point, even if the campsites nearby are inferior.

However, other factors would also be weighed in the

decision. How far away is that next vantage point? Is it possible to get there before sunset? How tired is the photographer? Must a hiking companion's needs be considered? All these factors can lead to satisficing behavior. The existence of constraints was acknowledged in constructing the campsite choice model. However, neither test made allowances for satisficing. Thus, while the model describes campsite choice, the tests measured campsite preference. These are similar, but not identical.

Earlier, two explanations were offered to account for differences between the predicted and measured order of importance of campsite attributes: (1) that experience goals can be so important that campsite features which enhance those goals become necessities; or (2) that the campsite choice process is not always non-compensatory. Now a third explanation should be considered. Perhaps it isn't the model that is flawed, but the methodology. The survey respondents rated the importance of campsite attributes under ideal conditions. Those ratings may not reflect choices they would make under less-than-ideal conditions.

A recurring problem in campsite research has been the gap between reported and observed behavior. Observational studies measure actual choices rather than preferences, but require researchers to make inferences about why those choices were made. Disagreement between researcher-defined and subject-defined variables has been recognized in other

contexts (Vaske et al., 1983), and it appears to have affected campsite choice research as well. Pfister's (1977) observations led to a regression equation where the single most important factor in campsite choice was the size of the nearest tributary stream -- a criterion identified in no other study. Similarly, Heberlein and Dunwiddie's (1979) finding that experienced backpackers camped farther from other parties than inexperienced visitors could not be replicated in surveys of visitors to the Kings Canyon National Park (Zuckert, 1980) or the Enchantments.

Survey methods have other pitfalls. Zuckert (1980) found that some campers couldn't identify the factors which influenced their choice of campsites. Bumgardner et al. (1988) found in a study of campers at Texas reservoirs that while distance to the lake was the most frequently mentioned site-choice factor, visibility and accessibility of the lake both measured the actual choices better than distance. Lee (1977), Hancock (1973) and Foster and Jackson (1979) each found that people did not always choose campsites according to their stated preferences.

Because the Deschutes and Enchantments studies contained setting-specific lists of campsite attributes, they should have provided a better measure of attribute importance than open-ended surveys where campers may not have been able to immediately recall what influenced their choices, or where some important attributes were considered

"too obvious" to mention. The method also was able to avoid discrepancies between what actually influences people's site choices and what an observer thinks has influenced their choices. However, the method did not account for differences between stated preference and actual behavior. A means of resolving this problem should be found before the campsite choice model is completely accepted or rejected.

Perhaps the simplest way to test the model within the survey format would be to define necessity, experience and amenity attributes, then give a list of site characteristics and ask respondents to place each characteristic into one of the three categories. There would be no guarantee, however, that campers would actually follow those categorizations under constrained conditions. Another method would be to use a Likert-type scale format, but include a follow-up question asking which attributes the camper would not forgo under constrained conditions. A more complex method would be to describe a series of constrained scenarios and ask campers to choose which attributes they would consider under such conditions.⁴ Examples of each of these survey formats are given in Appendix B.

⁴The model could be tested experimentally in a similar fashion using a game simulation. A computer program could be written in which subjects must choose a campsite after being led through one of several randomly assigned scenarios which simulate actual conditions. The disadvantage of this method (aside from the need for fairly advanced programming skills) is that campers would have to visit a central location to "play." Obtaining a representative sample could be difficult.

While further research of this kind is probably necessary to validate the campsite choice model, the model can still be useful in its present form. An attribute classification system has been offered which can help managers identify the campsite characteristics which are most likely to influence the success or failure of a visit to a dispersed recreation setting.

In areas where increasing use threatens to degrade the social or ecological setting, the model can help managers decide if more resilient or less crowded environments are capable of providing the camping experience that visitors seek. It can also alert managers to be wary of placing too much emphasis on attributes, such as the amount of bare ground, which may be ecologically undesirable but seem to have little adverse influence on the camping experience.

Managers must be sure to account for differences in the experience goals of various segments of the user population, and must be sensitive to variations in site requirements which may occur due to differences in camping style. But if the necessities for a user population are known, managers can steer campers to settings that are best able to provide those necessities. And if their experience goals can be identified, managers can help ensure that the campsites provided will enhance those goals rather than interfere with them.

BIBLIOGRAPHY

- Ajzen, Icek, and Martin Fishbein. 1980. Understanding Attitudes and Predicting Behavior. Englewood Cliffs, N.J.: Prentice-Hall Inc.
- Balling, John D. and John H. Falk. 1982. Development of Visual Preference for Natural Environments. Environment and Behavior 14(1): 5-28.
- Brown, Perry J., and John H. Schomaker. 1974. Final Report on Criteria for Potential Wilderness Campsites. Logan, Utah: Institute for Study of Outdoor Recreation and Tourism. Supplement No. 32 to 12-11-204-3.
- Brown, Perry J. and Glenn Haas. 1980. Wilderness Recreation Experiences: The Rawah Case. Journal of Leisure Research 12(3): 229-241.
- Bumgardner, Walter H., Michael R. Waring, Michael H. Legg and Lydia Goetz. 1988. Key Indicators of Campsite Selection at Corps of Engineers Lakes. Journal of Park and Recreation Administration 6(1): 62-78.
- Clark, Roger N., Russel W. Koch, Mack L. Hogans, Harriet H. Christensen and John C. Hendee. 1984. The Value of Roded, Multiple-use Areas as Recreation Sites. USDA Forest Service Res. Paper PNW-319. Pacific Northwest Forest and Range Experiment Station, Portland, Ore.
- Clark, Roger N. and George H. Stankey. 1986. Site Attributes -- A Key to Managing Wilderness and Dispersed Recreation. Proceedings -- National Wilderness Research Conference: Current Research. USDA Forest Service General Tech. Report INT-212. Intermountain Forest and Range Experiment Station, Ogden, Utah, pp. 509-515.
- Cowdin, Nancy P. 1986. Conceptions and Behaviors of Recreationists Regarding Water Quality in Rocky Mountain National Park. Proceedings -- National Wilderness Research Conference: Current Research. USDA Forest Service Gen. Tech. Report INT-212. Intermountain Forest and Range Experiment Station, Ogden, Utah, pp. 241-244.
- Dillman, Don A. 1978. Mail and Telephone Surveys: The Total Design Method. New York: John Wiley and Sons.
- Driver, B.L., and Richard C. Knopf. 1976. Temporary Escape: One Product of Sport Fisheries Management. Fisheries 1(2): 21-29.

- Foster, R.J. and Edgar L. Jackson. 1979. Factors Associated with Camping Satisfaction in Alberta Provincial Park Campgrounds. Journal of Leisure Research 11(4): 292-306.
- Frissell, Sidney S., and D.P. Duncan. 1965. Campsite Preference and Deterioration in the Quetico-Superior Canoe Country. Journal of Forestry 63(4): 256-260.
- Haas, Glenn E., B.L. Driver, Perry J. Brown and Robert G. Lucas. 1987. Wilderness Management Zoning. Journal of Forestry (Dec.) 17-21.
- Hancock, H.K. 1973. Recreation Preference: Its Relation to User Behavior. Journal of Forestry 71:336-337.
- Harris, Charles C., B.L. Driver and E.P. Bergerson. 1985. Do Choices of Sport Fisheries Reflect Angler Preferences for Site Attributes? Proceedings: Symposium on Recreation Choice Behavior. USDA Forest Service Gen. Tech. Rep. INT-184, Intermountain Forest and Range Experiment Station, Ogden, Utah, pp. 120-128.
- Harris, Richard L. 1982. Evaluating Methods for Measuring Visitor Perceptions of Ecological Impacts at Wilderness Campsites. Unpublished M.S. thesis, Oregon State Univ.
- Heberlein, T.A., and Peter Dunwiddie. 1979. Systematic Observation of Use Levels, Campsite Selection and Visitor Characteristics at a High Mountain Lake. Journal of Leisure Research 11(4): 307-316.
- Krumpe, Edwin E., and William J. McLaughlin. 1982. A Model of Recreationists' Decisionmaking Process. Forest and River Recreation: Research Update. University of Minnesota Agricultural Experiment Station Misc. Publication 18-1982, St. Paul, Minn., pp. 94-99.
- Lee, Robert G. 1977. Alone with Others: The Paradox of Privacy in Wilderness. Leisure Sciences 1(1) 3-19.
- Lime, David W. 1971. Factors Influencing Campground Use in the Superior National Forest. USDA Forest Service Res. Paper NC-60. North Central Forest Experiment Station, St. Paul, Minn.
- Loder, Arthur W. 1978. Relationship of Camper Characteristics and Choice of a Campground. Unpublished M.S. thesis, Pennsylvania State Univ.

- Lucas, Robert C. 1985. Visitor Characteristics, Attitudes and Use Patterns in the Bob Marshall Wilderness Complex, 1970-82. USDA Forest Service Res. Paper INT-345. Intermountain Forest and Range Experiment Station, Ogden, Utah.
- Merriam, Larry C., and C.K. Smith. 1974. Visitor Impact on Newly Developed Campsites in the Boundary Waters Canoe Area. Journal of Forestry 72(10): 627-630.
- Newby, Floyd L. 1971. Understanding the Visual Resource. Recreation Symposium Proceedings. USDA Forest Service Gen. Tech. Rep. NE-57. Northeastern Forest Experiment Station, Upper Darby, Pa., pp. 5-22.
- Parsons, David J. 1986. Campsite Impact Data as a Basis for Determining Wilderness Use Capacities. Proceedings -- National Wilderness Research Conference: Current Research. USDA Forest Service Gen. Tech. Rep. INT-212. Intermountain Forest Experiment Station, pp. 449-455.
- Peterson, George L., Daniel J. Stynes, Donald H. Rosenthal and John F. Dwyer. 1985. Substitution in Recreation Choice Behavior. Proceedings: Symposium on Recreation Choice Behavior. USDA Forest Service Gen. Tech. Rep. INT-184. Intermountain Forest and Range Experiment Station, Ogden, Utah, pp. 19-30.
- Pfister, Robert E. 1977. Campsite Choice Behavior in the River Setting: A Pilot Study on the Rogue River, Oregon. Proceedings: River Recreation Management and Research Symposium. USDA Forest Service Gen. Tech. Rep. NC-29. North Central Forest Experiment Station, St. Paul, Minn. pp. 351-358.
- Ruddell, Edward J. and William E. Hammitt. 1987. Prospect Refuge Theory: A Psychological Orientation for Edge Effect in Recreation Environments. Journal of Leisure Research 19(4): 249-260.
- Schomaker, John H. 1973. Development of a Means to Assess the Ability of Wilderness Areas to Produce Recreation Opportunities. Unpublished M.S. thesis, Utah State Univ.
- Schreyer, Richard, Richard C. Knopf and Daniel R. Williams. 1985. Reconceptualizing the Motive/Environment Link in Recreation Choice Behavior. Proceedings: Symposium on Recreation Choice Behavior. USDA Forest Service Gen. Tech. Rep. INT-184. Intermountain Forest and Range Experiment Station, Ogden, Utah, pp. 9-18.

- Shafer, Elwood L., John Hamilton and Elizabeth Schmidt. 1969. Natural Landscape Preferences: A Predictive Model. Journal of Leisure Research 1(1): 1-19.
- Shelby, Bo, and Thomas A. Heberlein. 1986. Carrying Capacity in Recreation Settings. Corvallis, OR: Oregon State University Press.
- Shelby, Bo, Jerry J. Vaske and Rick Harris. 1988. User Standards for Ecological Impacts at Wilderness Campsites. Journal of Leisure Research 20(3): 245-256.
- Shelby, Bo, Douglas Whittaker, Robert Speaker and Edwin E. Starkey. 1987. Social and Ecological Impacts of Recreation Use on the Deschutes River Scenic Waterway. Report to Oregon Legislature, February 1987.
- Simon, Herbert A. 1959. Theories of Decision-Making in Economics and Behavioral Science. American Economic Review 49(3): 253-283.
- Stankey, George H. 1973. Visitor Perception of Wilderness Recreation Carrying Capacity. USDA Forest Service Research Paper INT-142. Intermountain Forest and Range Experiment Station, Ogden, Utah.
- Stankey, George H., David N. Cole, Robert C. Lucas, Margaret E. Peterson and Sidney S. Frissell. 1985. The Limits of Acceptable Change System for Wilderness Planning. USDA Forest Service Gen. Tech. Report INT-176. Intermountain Forest and Range Experiment Station, Ogden, Utah.
- Statistical Graphics Corp. 1987. Statgraphics.
- Twight, Ben W., Kenneth L. Smith and Gordon H. Wissinger. 1981. Privacy and Camping: Closeness to the Self vs. Closeness to Others. Leisure Sciences 4(4): 427-441.
- Vaske, Jerry J., Maureen Donnelly and D.L. Tweed. 1983. Recreationist-Defined vs. Researcher-Defined Similarity Judgments in Substitutability Research. Journal of Leisure Research 16(3): 251-262.
- Watson, Alan E., and Joseph W. Roggenbuck. 1985. Approximating Recreation Site Choice: The Predictive Capability of a Lexicographic Semi-Order Model. Proceedings: Symposium on Recreation Choice Behavior. USDA Forest Service Gen. Tech. Report INT-184. Intermountain Forest and Range Research Station, Ogden, Utah, pp. 55-60.

- Whittaker, Douglas P. 1987. Impacts, Standards and Perceived Crowding on the Deschutes River: Extending Carrying Capacity Research. Unpublished M.S. thesis, Oregon State Univ.
- Williams, Daniel R. 1985. A Developmental Model of Recreation Choice Behavior. Proceedings: Symposium on Recreation Choice Behavior. USDA Tech. Rep. INT-184. Intermountain Forest and Range Experiment Station, Ogden, Utah. pp. 31-37.
- Zuckert, Judith A. 1980. Environmental and Psychological Determinants of Campsite Selection at a High Sierra Lake. Unpublished M.S. thesis, Colorado State Univ.

APPENDICES

APPENDIX A

WATER AND SCENERY AS FACTORS IN CAMPSITE CHOICE

The Enchantments study provided an opportunity to learn more about two campsite choice criteria -- scenic beauty and distance to water -- which can encompass a broad range of site attributes. These attributes had been identified as important in other settings (e.g., Lime, 1971; Zuckert, 1980; Harris, 1982) and appeared likely to be significant factors in campsite choice in the Enchantments.

Environmental psychologists and landscape architects have devoted considerable research effort to sorting out the meanings of scenic preferences. It has been observed that people tend to prefer "edge environments" -- alongside lakes or rivers, or at the forest-meadow interface -- to ones that may seem more exposed (Newby, 1971; Ruddell and Hammitt, 1987). Lake views seem to be especially favored (Schafer, 1969; Balling and Falk, 1982).

In the campsite selection studies, Schomaker (1973) found that campsites near lakes were used more often than ones near streams, and Lime (1971) found that lakeside campsites were sought primarily for their views. Yet in the Mount Jefferson Wilderness, where most people camp beside lakes, a view of Mount Jefferson was the choice factor which campers mentioned most often (Harris, 1982). While this finding may seem surprising in light of landscape preference

research, it should be noted that mountain vistas do have the landscape attributes identified by Balling and Falk (1982) as most important: even ground texture, good depth of field, a relatively high degree of complexity, a clear focal point and a sense of limited mystery (explorability).

In the Enchantments survey, three different scenic possibilities were offered. Visitors rated mountain views most important (2.83), followed by lakes (2.55) and finally streams (1.86). The same order of preference was followed by all three activity groups, but group members differed in the importance they placed on various scenic attributes. For climbers, mountain views have a practical purpose as well as an aesthetic one (see the discussion of the Enchantments test), yet climbers' mean importance score for mountain views was not significantly different from that of hikers or campers ($F=1.35$). Climbers did place less importance than either hikers or campers on lake views ($F=15.29$, $p<.0001$) and stream views ($F=13.75$, $p<.0001$).

It seems likely that in the context of campsite choice, scenic preference has both a setting-specific dimension and an activity-specific dimension. High peaks are the primary scenic feature of the Enchantments, and every visitor wants to enjoy them. Harris (1982) found the same phenomenon at Mount Jefferson. Similarly, it is no surprise that views of lakes were sought by 91 percent of the campers in northern Minnesota's lake district (Lime, 1971). But activity

preferences also seem to play a part. Visitors who wanted to engage in an activity associated with a certain scenic vista -- e.g., viewing wildlife alongside streams -- considered that view important as well as the mountain view. Likewise, fishermen tended to put more importance on lake views. For climbers in the Enchantments, the activity-specific view preference matches the setting-specific view preference, so mountain views were of paramount importance while neither lake nor stream views were very important at all.

Distance to water has been identified as a campsite attribute in many studies, but it has not always been clear why campers wanted to be close to water. Bodies of water seem to have three different functions for campers: as sources of drinking water, as focal points for activities, and as scenic backdrops. In some settings, all three purposes may be served, while in others only one or two may be applicable.

Lakes and streams are used as sources of drinking water only in certain types of settings. Loder (1978) found in a study of auto and canoe campground visitors that only people who scored high on a wilderness scale were willing to stay at campgrounds without a domestic water source. Yet Cowdin (1986) found that 33 of 34 overnight visitors to Rocky Mountain National Park used lake or stream water for cooking and/or drinking during their trip.

In more developed settings, where developed sources of drinking water are usually provided, lakes and streams still fulfill multiple needs. Lime (1971) reported that 77 percent of national forest auto campers preferred waterfront sites, and 91 percent said they did so because of the view. Yet he also found that the quality of fishing was the most common reason for choosing a campground to stay in. Views of water may serve both aesthetic and utilitarian purposes: In a study of Southern reservoir visitors, nearly half said they wanted a site which allowed them to watch their boat (Bumgardner et al., 1988). The latter study also discovered that, while campers said distance to the lake was the most important factor in their choice of a campsite, observation suggested that visibility of the lake was the key factor.

Water also serves multiple purposes for backcountry campers. Schomaker (1973) found that campsites next to lakes were used more often than ones beside streams, though either would serve equally well for quenching thirst. Heberlein and Dunwiddie (1979) found that anglers in the Bridger Wilderness camped nearer to lakes than climbers did. This may be partly due to scenic preference (see above) and partly because water is also the milieu for their primary recreation activity.

The Enchantments study offered an opportunity to measure the relative importance of different meanings of water in a backcountry setting. Four different campsite

attributes were water-related: close to good fishing, close to drinking water, good view of lake(s) and good view of stream. Drinking water was the most important of these, having a mean importance score of 2.81, followed by lake views (2.55), stream views (1.86) and proximity to fishing (1.49). The same general order of importance was followed by all three activity groups, though importance scores varied considerably between groups.

Considered together, the two studies outlined in this thesis provide confirmation that water can have several meanings in campsite choice. They also provide a good example of how setting characteristics determine those meanings. In the Enchantments, water is needed for drinking, but lakes are also valued for aesthetic reasons. Deschutes campers, who can haul their own water supplies in boats or automobiles, value water as an activity focus. Thus while proximity to fishing was a minor issue in the Enchantments, it was the single most important experience attribute for Deschutes campers.

APPENDIX B

SAMPLE QUESTIONS FOR FURTHER TESTS OF THE CAMPSITE MODEL

Example 1

1. Campsites can have a number of characteristics, and these characteristics can serve several different purposes. In the next section of this survey, we'd like you to consider three types of campsite attribute:

Necessity attribute - A characteristic which a campsite must have if the camper wants to enjoy a minimally satisfying trip. For example, people who camp in large travel trailers must have a space that has room for parking their rig.

Experience attribute - A characteristic which can make the camper's trip more satisfying overall, because it helps to provide a particular kind of recreational experience. A Hawaiian example might be a campsite located near big surf.

Amenity attribute - A characteristic which can provide a greater degree of comfort during a camping trip, but which isn't an absolute requirement. One example in a developed campground might be a site located near the water pump.

For the following campsite features, please tell us whether you think it is a necessity, experience or amenity attribute (circle the best answer)

Shade	Necessity	Experience	Amenity
Flat ground	Necessity	Experience	Amenity
Away from other campers	Necessity	Experience	Amenity
Close to shore of lake	Necessity	Experience	Amenity
Good view of mountains	Necessity	Experience	Amenity
Close to toilets	Necessity	Experience	Amenity
Screened from other sites	Necessity	Experience	Amenity
Gets morning sun	Necessity	Experience	Amenity
Close to trail	Necessity	Experience	Amenity
Dry and well-drained	Necessity	Experience	Amenity

Example 2

1. Campsites can have a number of characteristics. For the following list of campsite attributes, please tell us how important each one is to you. (Circle the best choice)

<u>Important</u>	<u>Not</u> <u>Important</u>	<u>Somewhat</u> <u>Important</u>	<u>Very</u> <u>Important</u>
Shade	1	2	3 4
Flat ground	1	2	3 4
Away from other campers	1	2	3 4
Close to shore of lake	1	2	3 4
Good view of mountains	1	2	3 4
Close to toilets	1	2	3 4
Screened from other sites	1	2	3 4
Gets morning sun	1	2	3 4
Close to trail	1	2	3 4
Dry and well-drained	1	2	3 4

2. Now we'd like to know which of these campsite attributes are necessary for a minimally satisfying camping experience. Imagine that you arrive at a camping destination and there is only one site left. You can take the last site, or else hike another mile to the next camping area. Which attributes must be present the remaining campsite before you will decide to take it? (Check all that apply)

- | | |
|--|--|
| <input type="checkbox"/> Shade | <input type="checkbox"/> Close to toilets |
| <input type="checkbox"/> Flat ground | <input type="checkbox"/> Screened from other sites |
| <input type="checkbox"/> Away from other campers | <input type="checkbox"/> Gets morning sun |
| <input type="checkbox"/> Close to shore of lake | <input type="checkbox"/> Close to trail |
| <input type="checkbox"/> Good view of mountains | <input type="checkbox"/> Dry and well-drained |

Example 3

1. For the next set of questions, we'd like you to imagine that you have just hiked to a large wilderness lake. Twenty campsites are located on or near the lake. These campsites offer a number of different features, but not every site has every one of these features. For the following situations, please check which features you would require at a site before you would camp there.

a. It's a weekday in midsummer. The weather is perfect, and you're the first person to arrive at the lake.

- | | |
|--|--|
| <input type="checkbox"/> Shade | <input type="checkbox"/> Close to toilets |
| <input type="checkbox"/> Flat ground | <input type="checkbox"/> Screened from other sites |
| <input type="checkbox"/> Away from other campers | <input type="checkbox"/> Gets morning sun |
| <input type="checkbox"/> Close to shore of lake | <input type="checkbox"/> Close to trail |
| <input type="checkbox"/> Good view of mountains | <input type="checkbox"/> Dry and well-drained |
| <input type="checkbox"/> I would continue to a destination with better sites | |

b. It's a weekday in midsummer. A storm is brewing, and you're getting a blister. No one else is at the lake, but it will take 30 minutes to check out all 20 campsites.

- | | |
|--|--|
| <input type="checkbox"/> Shade | <input type="checkbox"/> Close to toilets |
| <input type="checkbox"/> Flat ground | <input type="checkbox"/> Screened from other sites |
| <input type="checkbox"/> Away from other campers | <input type="checkbox"/> Gets morning sun |
| <input type="checkbox"/> Close to shore of lake | <input type="checkbox"/> Close to trail |
| <input type="checkbox"/> Good view of mountains | <input type="checkbox"/> Dry and well-drained |
| <input type="checkbox"/> I would continue to a destination with better sites | |

c. It's a Saturday in midsummer. All but two of the sites next to the lake are taken, and a Boy Scout troop is setting up their tents on the site between those two.

- | | |
|--|--|
| <input type="checkbox"/> Shade | <input type="checkbox"/> Close to toilets |
| <input type="checkbox"/> Flat ground | <input type="checkbox"/> Screened from other sites |
| <input type="checkbox"/> Away from other campers | <input type="checkbox"/> Gets morning sun |
| <input type="checkbox"/> Close to shore of lake | <input type="checkbox"/> Close to trail |
| <input type="checkbox"/> Good view of mountains | <input type="checkbox"/> Dry and well-drained |
| <input type="checkbox"/> I would continue to a destination with better sites | |

d. It's the hottest day of the summer, and only two sites are left when you arrive. Both sites are in an open, sloping meadow about 300 yards from the lake and trail.

- | | |
|--|--|
| <input type="checkbox"/> Shade | <input type="checkbox"/> Close to toilets |
| <input type="checkbox"/> Flat ground | <input type="checkbox"/> Screened from other sites |
| <input type="checkbox"/> Away from other campers | <input type="checkbox"/> Gets morning sun |
| <input type="checkbox"/> Close to shore of lake | <input type="checkbox"/> Close to trail |
| <input type="checkbox"/> Good view of mountains | <input type="checkbox"/> Dry and well-drained |
| <input type="checkbox"/> I would continue to a destination with better sites | |