AN ABSTRACT OF THE THESIS OF

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Extensive use of wilderness campsites has caused resource deterioration in numerous backcountry locations. Resource managers are responsible for maintaining natural wilderness-like conditions in these areas and providing opportunities for the public to use and enjoy them. This requires that realistic standards for resource impacts be determined and that publicly supported management programs be implemented. This study examines six interest group evaluations of selected criteria for wilderness campsites to help identify ecological and social impact norms and establish appropriate management policies.

Two papers are presented in this thesis to address these subjects. The first explores group norms for bare ground and fire ring impacts. Little research has been previously conducted on the norms of organized groups for ecological impacts. This study evaluates normative data and compares similarities and differences among groups. Results indicate that for most groups, all but the most severe impact levels were acceptable. While certain

differences exist, agreement rates allow some consolidation of groups for evaluation purposes. Findings also imply that other campsite attributes may be more important to users than the presence of ecological impacts.

The second paper examines the role of ecological and social attributes in the campsite selection process and assesses interest group support for management policies which could be implemented to keep impacts within acceptable limits. Results suggest a low level of concern over ecological attributes and that social factors or other campsite features are more important than the condition of the site itself. It appears visitors will continue to camp on impacted sites to achieve other objectives, and continued demand for these sites may make rehabilitation difficult. Visitor support for increased management action was high overall. Findings suggest user groups support controls for site improvement (e.g. closing sites for recovery), as well as management actions which regulate wilderness access (e.g. requiring a permit). Controls on types of uses inside the wilderness (e.g. limiting the use of campfires) were supported at lower levels.

Interest Group Evaluations of Ecological, Social, and Management Criteria for Wilderness Campsites

by

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I. INTRODUCTION

Change in resource and social conditions at wilderness campsites continues to be a management challenge. Backcountry managers are faced with the dual responsibility of protecting the unique qualities of these sites and providing public access and opportunities for camping experiences. Although there is general agreement by both wilderness users (Stankey, 1980; Anderson & Manfredo, 1986; Shelby et al., 1989) and resource managers (Washburne & Cole, 1983) that measures are necessary to retain the wilderness character of high-use sites, answers are not clearcut. One of the reasons appropriate solutions are difficult to achieve is that the wilderness constituency is made up of a variety of users with a variety of interests. Different uses put uneven demands on the wilderness resource (Hammitt & Cole, 1987), and different interests suggest that assorted preferences for experiences and management may vary from one group to another.

An essential element in developing management strategies for recreation settings has been to obtain information about visitor patterns and preferences (McDonald & Hammitt, 1986). Several frameworks (see Driver

& Brown, 1978; Stankey et al., 1985; Shelby & Heberlein, 1986) have been developed to synthesize this information in order to measure change in resource conditions, identify opportunities for distinctive experiences, and establish acceptable impact standards for identifiable environments. Such frameworks can be applied to specific locations, such as campsites, and thus to determining the acceptability of specific ecological or social impacts (Shelby, et al., 1988). The collection and evaluation of empirical data are critical steps in the implementation of successful management programs. Accurate judgments about trends and visitor willingness to support management action will lead to better decisions in the long run, since users ultimately decide by their actions which backcountry policies will be effective.

THESIS OVERVIEW

This thesis addresses users' and managers' evaluations of selected criteria for wilderness campsites. It was written in accordance with Oregon State University guidelines for the manuscript option. The thesis includes two papers which help identify standards for ecological and social impacts and preferences for appropriate management policies.

The first paper examines the norms of organized interest groups for bare ground and fire ring impacts. Although considerable research has been accomplished in

this area for individual visitors at specific wilderness destinations (e.g. Merriam & Smith, 1974; Heberlein & Dunwiddie, 1979; Harris, 1983; Shelby et al., 1988), interest group preferences are not well represented in the literature. Organized groups sampled in the present study were backcountry horse clubs, hunting associations, hiking clubs, explorer scout troops, conservation organizations and resource managers.

The investigation of groups provides a means of exploring where similarities and differences exist in campsite standards for identifiable segments of the wilderness constituency. If results indicate differences, managers can better address user concerns and conflicts; if there is agreement among groups, the findings represent a cross section of the user population. An additional benefit of finding interest group agreement is the potential for managers to consider fewer groups when making resource decisions.

The second paper examines the role of resource and social attributes in the campsite selection process and assesses visitor support for management policies which could be implemented to keep impacts within acceptable limits. After identifying group norms for ecological impacts at campsites in the first paper, these additional areas are a logical extension of the research. The opportunity to explore the relative importance of

ecological and social conditions would add to an area that is in need of further study. Considerable work on ecological and social impacts has been done separately, but there is little comparing the two. In addition, it was possible to look at these attributes in relation to other campsite selection criteria (proximity to water, scenic views, available firewood, etc.). Evaluating the relative importance of a full range of site criteria may help in assessing visitor support for specific management actions designed to improve conditions. Although many visitors favor regulation to protect their recreation experiences (Anderson & Manfredo, 1986; Shelby et al., 1989), Clark and Stankey (1986) suggest the success of such programs may depend on which attributes are addressed and how.

The final aspect of the second study, visitor opinion of potential management solutions, became a subject of interest during the planning stages of the first paper. Wilderness managers in the Pacific Northwest had been weighing the merits of implementing additional controls in a number of high-use locations. Since a desired outcome was to reduce impacts, it made sense to combine the study of the acceptability of impacts with an assessment of user preferences for limitations on use. The management actions selected for study were based on discussions with Forest Service planning staff who were considering increased

regulation of three popular wilderness areas in Region 6 - Three Sisters, Mt. Jefferson, and Mt. Washington.

Interest Groups

Data for this thesis were collected from a survey of six organized groups who were identified as having an interest in designated wilderness areas. Researchers and managers have typically gathered user information from individual visitors on site; however, it is organized groups who have become most active in the planning process (Dennis & Zube, 1988). Backcountry activity clubs and conservation organizations are interested in management issues for continued use and protection of the resource, but the opinions of these groups are usually represented by a few individuals in leadership roles. Collecting responses from entire clubs and groups was viewed not only as a practical method of assessing the backcountry constituency, but as a way to identify the norms and preferences of these organizations as a whole.

Management agencies are already looking to interest groups for help. The Forest Service's National Recreation Strategy (USDA, 1988) seeks the experience and diversity of opinions from outdoor recreation user groups as a preferred method for balanced forest planning. As evidence, Hansen (1990) cites examples of resource managers finding backcountry interest groups such as canoe and trail clubs,

scouting organizations, and conservation groups to be helpful partners in the formation of wilderness policy.

For the present research, wilderness managers were contacted for references on local organized groups or clubs who had been active in backcountry use and/or management issues. From these, five groups were selected as representative, and two organizations in each category were surveyed to be certain sample size was sufficient. The groups were hunting associations, backcountry horse clubs, explorer scout troops, hiking clubs, and a conservation organization (two Sierra Club chapters). The sixth organization included in the study was a group of Forest Service backcountry managers. A widely held view is that the perspectives of managers and users are different (e.g. Hendee & Pyle, 1971; Lucas, 1979; Downing & Clark, 1979), but comparing these opinions continues to provide useful information, especially when managers are responsible for setting standards, and users are the ones who eventually determine if policies are successful.

Methods

Data were collected from group members using a slide presentation and self administered questionnaire at group meetings. Respondents evaluated the acceptability of a range of bare ground and fire ring impacts depicted in a series of slides. The photo survey method offered an efficient means of data collection and has previously

proven to be an accurate way of obtaining responses from a dispersed user population (Shelby & Harris, 1985; Brown et al., 1988). In a second section of the questionnaire, responses were collected relating to wilderness travel experiences and use preferences. Likert-type scales were used by respondents to provide opinions on the importance of 15 campsite attributes and preferences for 12 management policies.

Campsites

The study of wilderness campsites was of interest because they are the destination of most backcountry visitors, often being the focal point for recreation activity and the enjoyment of close relationships with traveling companions (Lucas, Cole & Stankey, 1985). In a report on wilderness areas across the United States, Cole (1985) identified that many campsites have experienced conspicuous evidence of human overuse and serious problems of visual impact. This opinion is shared by a majority of resource managers. A separate nationwide survey of managers regarding problems and practices in wilderness areas revealed that over 70 percent viewed changes in campsite conditions as a major problem (Washburne & Cole, 1983). There is no research to indicate that concerns have diminished in recent years.

OVERVIEW OF CONCEPTS

Determining how much and what kinds of change in environmental conditions is acceptable requires the use of common concepts. The research conducted for this thesis followed lines of previous study in which general agreement on terminology had been established. To properly extend research in this area of inquiry, the same concepts have been employed.

Impacts

"Impact" is a term commonly used in environmental research; it is often applied in assessing changes in wilderness conditions. Through extensive backcountry recreation research, Lucas (1979) argued for a neutral definition of the term. He observed that it is human judgment which places a positive or negative value on the resource conditions; thus, "impact" or "change" refers to an objective description of the environmental effects of recreational use, ranging from zero to some high level.

Clark and Stankey (1979) identified three types of impacts (ecological, social, and managerial) in defining visitor impacts in their work on the Recreation Opportunity Spectrum. Shelby & Heberlein (1986) used some of the same terms in their description of impact types for carrying capacity assessment, suggesting impacts can be either ecological, physical, facility, or social, depending on the affected element of the recreation system. Both sets of

researchers agreed that the evaluation of impacts is essential to the development of management parameters.

A considerable body of research has been applied to the study of impacts. Lucas, Cole, and Stankey (1985) cite a program of applied research by the wilderness resource work unit at the Intermountain Forest and Range Experiment Station. A substantial portion of the unit's work has focused on ecological research of recreational impacts on campsites and trails as well as social impacts such as crowding and encounters. All three researchers have contributed substantially to the study of impacts (e.g. Cole 1982, 1983, 1985, 1987; Lucas 1979, 1980, 1985, 1986; Stankey 1973, 1980; Stankey et al., 1985).

The first paper in this thesis addresses two such ecological impacts (bare ground and fire rings). Hammitt and Cole (1987) referred to ecological, or resource, impacts as descriptors of the environmental effects of recreational use. Similarly, Shelby and Heberlein (1986) characterize ecological impacts as those which affect the ecosystem. These impacts may result in changes to an area's vegetation, soil, wildlife, air quality, or water resources. The second paper introduces social impacts for comparison. Social impacts usually refer to the presence of others and the desirability of certain conditions (Schreyer, 1984). Shelby and Heberlein (1986) describe these impacts in more detail as ones which alter human

experiences: "social impact parameters focus on the number, type, and location of encounters with other human groups, and on the way these encounters affect the recreation experience."

Recognizing that any use creates some impact, research on wildland recreation environments frequently moves beyond the issue of how impacts can be prevented to what level of impact is consistent with the type of opportunity being supplied (Clark & Stankey, 1979). This approach represents a reformulation of the recreational carrying capacity concept into the Limits of Acceptable Change System (Stankey et al., 1985). The LAC System is widely used by the Forest Service as a planning and management framework for setting standards for resource and social conditions in recreation settings. Within the context of the LAC model, this study adds to the empirical database for evaluating visitor preferences and developing suitable impact standards.

Norms

One useful component in addressing impact problems is to identify norms for appropriate impact levels. The concept of norms is well founded in social psychological literature. Cancian (1975) described normative theory as based on the conditions which are appropriate in social settings, and these "norms" are shared and regulated by the

individuals in those settings. In short, social norms refer to collective standards (Vaske, 1978).

With respect to resource issues, Vaske et al. (1986) described norms as standards which individuals use to evaluate social behavior or environmental conditions. To describe the social norms concept in recreation settings, Shelby and Heberlein (1986) argue that these shared evaluative guidelines help define what is appropriate for different kinds of experiences. According to Whittaker and Shelby (1988), obtaining evaluative information about acceptable conditions is an integral part of making decisions and managing impacts in recreation settings.

Social norm principles have been used extensively to evaluate crowding and encounter levels in numerous backcountry settings (e.g. Lucas, 1964; Stankey, 1973; Shelby, 1981). Recent research has extended the social norms model to the study of ecological impacts. Whittaker and Shelby (1988) evaluated boaters' standards for a variety of ecological and social impacts on the Deschutes River in central Oregon, while Shelby et al. (1988) assessed backpackers' tolerance of campsite impacts in the Mr. Jefferson Wilderness. Both studies concluded that information on user norms could be obtained and analyzed to help establish management standards for backcountry ecological impact levels.

Analysis of normative information can help managers identify a range of suitable alternatives for impact management. This thesis reports research which extends recent work on impact norms to include interest group evaluations. First, it examines group norms for ecological impacts at wilderness campsites. Second, it compares standards for a cross section of the wilderness constituency by looking at differences and similarities among interest groups. Third, it identifies preferences for attributes in the campsite selection process; and finally, it evaluates user group preferences for management policies designed to protect backcountry resources and recreation experiences.

Attributes

The recreational setting plays an important role in the ability of people to enjoy backcountry experiences. Each setting is made up of attributes, or features, which help define a specific site (Clark & Stankey, 1986). Examples are water, trees, flat ground, and solitude, which can be either positive or negative, depending on the user's point of view. McCool and others (1985) observed that a setting's attributes can facilitate or discourage not only certain activities, but also the satisfactions to be acquired from them. The focus of wilderness planning and management is often recreational settings and the commensurate attributes.

In research on indicators to monitor user patterns and preferences in the backcountry, Merigliano (1990) suggests attributes can be an important source of information to managers. They can be useful in indicating the quality of wilderness experiences, and consequently, help establish the target of management action. However, Merigliano (1990) cautions that managers should not concentrate solely on one type of setting attribute in making decisions. As caretakers of the wilderness resource, managers often view ecological attributes as most important (Lucas, 1979; Washburne & Cole, 1983), while visitors may place greater emphasis on social setting attributes (Lucas, et al. 1985; Shelby & Heberlein, 1986). Knowledge of a range of attributes will assist managers in evaluating the consequences of change that comes from resource use and their own management actions (Clark & Stankey, 1986).

This thesis includes research on campsite attributes, seeking to identify which site features are most important to visitors. After assessing norms for bare ground and fire ring impacts, it became apparent that other site selection criteria (the need for a flat tent site, desire to be close to water, etc.) may affect how users evaluate these ecological impacts. Campsite research by Brunson & Shelby (1990) suggests a hierarchy of attribute importance. It would be useful to know how users rank the importance of

social versus ecological attributes in evaluating wilderness campsites.

Managers and Users

Differences in the judgments of resource managers and users are well documented, as references throughout this thesis suggest. The intent here is not to reexamine each previous study on the topic, but to assess this condition with respect to some new issues. The specific direction of federal forest planning practices in recent years dictates that users be incorporated into the planning process. As part of an integrative management approach, individual user and interest group input is being sought along with that of other forest disciplines. This interdisciplinary strategy is seen as one which will ultimately result in better forest management.

It is important for managers to assess where their own values line up with those of users. Traditionally, managers have operated under a biological/scientific orientation toward resource management, while users have typically been more interested in their recreation experiences (Hendee & Pyle, 1971; Peterson, 1974; Lucas, 1979). These circumstances may translate to concern for ecological processes on the part of managers versus concern over social settings by users. But the staffing infrastructure of wilderness management agencies is changing. As the makeup of planning personnel evolves

within the bureaucracy, different values may emerge. Likewise, a better educated public may change its own ideas about what is important in our backcountry areas. Wherever these constituents stand on resource issues, the policy-making process is a political one. It is essential to understand the norms and preferences of both those who will set management standards and those who will either support or neglect them.

II. GROUP NORMS FOR ECOLOGICAL IMPACTS

INTRODUCTION

Substantial use of wilderness campsites has caused changes in the environmental conditions of many popular backcountry destinations. Finding a balance between resource use and resource protection, however, is a complex problem, one which presents a significant challenge to managers. To determine how much and what kinds of uses are acceptable for recreation settings, definitions of what constitutes environmental change and the setting of standards for acceptable impact levels are necessary (Marion & Lime, 1986).

Research on a variety of resource impacts has been conducted in the backcountry to assist managers in establishing such standards. The study of ecological impacts at campsites is viewed as particularly important to preserving natural conditions in these settings (Lucas, Cole & Stankey, 1985). Previous ecological research has examined individual visitor preferences at specific locations (Merriam & Smith, 1974; Heberlein & Dunwiddie, 1979; Kania, 1986; Shelby, Vaske & Harris, 1988), but few studies have focused on the perceptions of organized interest groups. The investigation of interest groups can provide a means for comparing differences and similarities

in the standards of identifiable segments of the wilderness constituency.

Stankey (1973, 1980) and Lucas (1980, 1985) have pointed out differences in user publics (particularly hikers and horsepackers), but this research has dealt mainly with differences in use characteristics or views on encounter levels. In another approach, Manfredo, Driver and Brown (1983) discuss groups based on their desired experiences, reporting on preferences for psychological experience outcomes such as escaping pressure or the need for autonomy or achievement. Only Lucas (1985) compared empirically the perceptions of two groups (again, hikers and horsepackers) toward campsite deterioration while surveying visitors to the Bob Marshall Complex in Montana. Taken together, this work addresses certain user group expectations and differences, but little of it actually focuses on group preferences for resource conditions.

Although little research has been concentrated on the norms of organized interest groups in wilderness, it has generally been assumed that differences exist in their use of the resource (Lucas, 1964; Stankey,1973; Hammitt & Cole, 1987). Because of this, it is often assumed that standards for impacts also may be different for different groups. This is an empirical issue that calls for research. If findings indicate similarities exist, it may be possible to condense the number of groups a manager needs to consider,

making complex resource decisions simpler. If there are differences, they can be more realistically taken into account to resolve concerns or conflict.

Lucas and others (1985) identified that campsites are important to wilderness visitors as the center of recreation activity and for the enjoyment of relationships with traveling companions. This paper explores norms for two campsite impacts which affect visitor use, bare ground and fire rings. Previous studies (Lucas, 1980; Cole, 1985) suggest that these impacts are among the most frequently encountered in the backcountry, but how site impacts are perceived by visitors is not well documented (Marion & Lime, 1986; Shelby et al., 1988). Information on how users perceive resource impacts will assist managers in the development of evaluative standards that determine carrying capacities for backcountry settings.

INTEREST GROUPS

Interest group theory contains several terms which help differentiate organized individuals from others in society. "Interest groups" have been defined as identifiable organized bodies representing the shared attitudes or interests of a group (Truman, 1971; McCarthy & Zald, 1977). Sociologists frequently classify voluntary organizations as "expressive" or "instrumental", depending on the purpose for which the associations were established (Gordon & Babchuk, 1959; Jacoby & Babchuk, 1963). Both

Hendee, et al. (1969) and Dennis & Zube (1988) observed that this dichotomy fits outdoor activity clubs and conservation groups rather well. They argue that expressive activity organizations (e.g. saddle and pack clubs, hunting associations, hiking groups) pursue specific types of recreation for their own benefit; while the interest of instrumental conservation organizations like the Audubon Society and the Sierra Club is in broader public goals, such as the preservation of natural resources.

These descriptions can be compared with those used to identify groups organized for political purposes. Lunch (1987) observed that in this arena, groups tend to represent either political interests or political ideas: "material" groups primarily represent economic or tangible interests, while "ideological" groups offer their supporters mainly symbolic rewards. The theoretical link to outdoor activity clubs and conservation groups is evident.

In the present research, both activity and conservation organizations are included and compared, along with resource managers. It made sense to proceed in this manner for several reasons. First, outdoor activity groups are a significant part of the wilderness user population (Hendee et al., 1968). These clubs and associations often are the most experienced visitors, are easy to access, and

show a willingness to get involved in the planning process. Many of these groups played key roles in helping establish the initial wilderness system (Allin, 1982), and in a number of cases even did much of the early trailhead and trail construction. Representative activity groups included in the current study were backcountry horse clubs, hunting associations, explorer scout troops, and hiking clubs.

Conservation groups are viewed as another important component of the wilderness constituency. Outdoor recreation participants are often members of conservation organizations (Dennis & Zube, 1988), possessing many of the attributes characteristic of more traditional activity groups. More importantly, conservation organizations have become a functional part of the wilderness planning/public participation process, typically the ones most active on behalf of the "public interest." Lunch (1987) credits the most adept of these groups with a high level of political expertise, particularly skilled in the use of publicity and litigation to further their goals. Two Sierra Club chapters were selected for the current study.

Last, resource managers were included as a study group because they are ultimately responsible for setting standards. With training in the biological sciences and their knowledge of specific ecological processes (Hendee and Pyle, 1971), it is often assumed that their actions

will be beneficial for both the visitor and the resource. Effective resource protection measures involve the careful integration of visitor and management strategies and methods (Marion & Lime, 1986). But managers and users do not always agree (Hendee & Pyle, 1971; Peterson, 1974; Downing & Clark, 1979), nor are management actions uniformly understood or accepted. It is generally agreed that a synthesis of resource managers' perceptions with those of the user public should lead to better management decisions and improved impact standards. A group of Forest Service managers with backcountry responsibilities were included to acquire the managerial perspective.

STANDARDS FOR ECOLOGICAL IMPACTS

Alteration of natural conditions as a result of recreational use has typically been defined as resource or ecological impact (Hammitt & Cole, 1987). For purposes of wilderness study, Lucas (1979) interpreted "impact" as a neutral term. Used together, ecological and impact refer to an objective description of the environmental effects of recreation use (Hammitt & Cole, 1987).

Shelby, Vaske and Harris (1988) explored ecological standards for individual visitors to campsites in Oregon's Mount Jefferson Wilderness, using Shelby and Harris's (1985) technique of soliciting visitor evaluations of photographs of site impacts. Focusing on bare ground and fire rings, they found moderate impacts are acceptable for

most users, but that standards appear to be different for the different experiences offered by different locations. Using a similar methodology, the present paper seeks to extend this research by assessing the standards of identifiable user groups for the same ecological impacts, and by gathering this information for wilderness campsites in general, rather than for a single location.

Based on earlier research efforts, four hypotheses were formulated. These are that (1) the norms of activity groups will be similar to each other, but (2) different from those of conservation groups, (3) the norms of hikers will be different from those of horsepackers, and (4) the views of managers will differ from those of user groups.

Previous research provides a basis for these suppositions. In the case of the first two hypotheses, Hendee et al., (1969) argue that although both expressive activity and instrumental conservation groups promote conservation generally, there is a distinct difference in their motives. Outdoor activity groups typically support conservation measures tied directly to those activities endorsed by their club (material interests), while conservation groups promote a preservation ethic meant more for resource protection than for resource use (ideological interests).

The third hypothesis was built largely on results of demonstrated differences for social impacts among hikers

and horsepackers by Stankey (1973) and Lucas (1985). Lucas (1985) also presented evidence of hikers' greater objections to soil and vegetation impacts. The fourth hypothesis regarding the views of managers and users reiterates the results of numerous studies supporting differences (e.g. Hendee & Pyle,1971; Peterson, 1974; Downing & Clark, 1979).

METHODOLOGY

Data for this project were collected utilizing a slide presentation and self-administered questionnaire format at group meetings. The study sample included 326 individuals 15 years or older who had visited legally designated wilderness areas (an additional eleven respondents that had not been to a designated wilderness were removed from the analysis). There was 100 percent participation from those present at group meetings. Group sizes were the following: explorer scouts (30), hunters (33), horse riders (40), Sierra Club members (55), hikers (77) and managers (91).

Photographs. In cases of environmental perception, Brown, et al. (1988) concluded that photographs are an accurate means of gathering responses from a dispersed user population. A number of studies have shown that judgments in photo surveys are highly correlated with on-site evaluations of the same settings (Daniel & Boster, 1976; Schroeder, 1984; Shelby & Harris, 1985). Photographs offer a more efficient means of data collection than field

evaluations. Slides can isolate a single campsite or fire ring without indicating proximity to a trail, body of water, or neighboring campsite and thus, decrease the likelihood of bias. Also, the opportunity to obtain responses from a variety of identifiable groups is increased. Finally, data collected by this technique are more likely to apply to wilderness campsites in general, rather than specific locations.

Groups. Six interest groups were chosen for inclusion in the study: hunters, horse riders, hikers, scouts, conservationists (Sierra Club) and resource managers. Activity and conservation clubs in Oregon's Willamette Valley were surveyed during a portion of regular membership meetings. The resource managers were Region 6 Forest Service staff members attending a workshop on wilderness and backcountry management issues.

Survey Instrument. All groups were administered a questionnaire consisting of two parts. In the first section, slides were shown depicting 17 wilderness campsites. For the first ten sites, respondents were asked to focus their attention on the amount of bare ground present. Slides depicted various amounts of bare ground ranging from none (a grass-covered area) to a 2275 square foot site denuded of vegetation. For the last seven sites, respondents focused on the size and appearance of fire

rings. Fire ring sizes ranged from no fire ring at all to a large 73 inch double-pit ring.

For each site evaluation the impact of interest was depicted twice, from different angles, and each slide included a person in the scene to provide perspective. Within each series, the order for evaluating sites was randomized. Participants were asked to rate the acceptability of each impact on a five point scale ranging from totally acceptable to totally unacceptable, with a neutral response at the midpoint.

The second section of the survey questionnaire included questions about wilderness travel experiences and use preferences to help in further evaluation of group standards for impacts.

Impact Categories. Using techniques developed by Shelby (1981) and Vaske, et al. (1986), standards for each group were obtained by combining acceptability ratings for all members of the group type and computing an acceptability mean for each site. Results were tabulated by grouping the sites into five impact categories based on the amount of impact present in the slides: *no impact*, *minimal*, *moderate*, *heavy*, and *severe*. These categories were assigned for evaluative purposes with respondents unaware of the labels. This method provided a format for easy comparison of groups at each level of impact.

To identify statistically significant differences between group means, an analysis of variance and a Least Significant Difference test were conducted. The LSD method was selected for its sensitivity to differences. In cases of multiple comparisons of means, this procedure tends to imply more significant differences than do the more conservative Tukey or Scheffe tests (Schaefer, 1988).

Acceptability Curves. Acceptability curves are derived from previous empirical studies by Vaske (1978), Shelby (1981), Vaske and others (1986), and Shelby and others (1988). These endeavors stem from Jackson's (1965) theoretical work on the structural characteristics of norms and the use of a return potential curve as a graphic device. Jackson's model suggests that analysis of the curves can be used to identify social norms which define the boundaries of acceptable campsite impacts. Following these methods, mean acceptability ratings were plotted for the impact categories used in the present study. Bare ground and fire ring impact evaluations may range from positive to negative, with the range of acceptable impact identified by the portion of the curve above the scale neutral line. The group's intensity, or strength of feeling about an impact, can be measured by the height of the curve above or below this neutral point. Plotting the curves also provides a visual means of assessing differences and similarities between groups.

RESULTS

Respondents used a five-point Likert-scale (1=totally unacceptable to 5=totally acceptable) to rate the bare ground and fire ring impacts. Results are discussed separately.

Bare Ground. Mean acceptability ratings for bare ground impacts are shown in Table 1. The hunters' scores exhibited a high degree of acceptability for the five impact levels, with the *no impact* site rated at 4.4 and the greater impact levels ranging from 3.2 to 3.5. Horse riders rated *no impact* at 4.3, and *minimal* to *severe* impacts at 3.0 to 3.9. Scouts rated *no impact* 3.7, with the *minimal* to *severe* ratings ranging from 2.8 to 4.0. Hikers are the group with the narrowest range of scores (3.2-3.9) for the five impact levels. In contrast, ratings of both the Sierra Club and managers steadily decreased as the level of impact increased. Managers reached unacceptability more quickly, however, judging the *heavy* impact at 2.6 and the *severe* 2.1.

Analysis of variance allows us to look at statistically significant ($P \leq .05$) differences between groups and assess agreement levels. The following generalizations are relevant to the hypotheses under consideration.

The first hypothesis suggested that the norms of the activity groups would be similar. Among the four

Table 1

Acceptability Ratings for Bare Ground Impacts

Bare Ground Impact (Sq ft)	Group Mean Scores						F Value
	Hunters	Horse Riders	Scouts	Hikers	Sierra Club	Managers	
None	4.4	4.3	3.7	3.9	4.0	4.3	NS
Minimal (50-200)	3.2^{abc}	3.0^{ab}	2.8^{a}	3.3^{bc}	3.4^{cd}	3.6^{d}	5.1^{*}
Moderate (450-700)	3.4^{ab}	3.3^{ab}	3.0^{a}	3.5^{b}	3.4^{b}	3.0^{a}	3.4^{*}
Heavy (1400-1800)	3.3^{b}	3.4^{b}	3.3^{b}	3.3^{b}	3.0^{b}	2.6^{a}	5.6^{*}
Severe (2200+)	3.5^{bc}	3.9^{c}	4.0^{c}	3.2^{b}	2.5^{a}	2.1^{a}	17.3^{**}

Scores based on five point scale: 1=totally unacceptable, 2=somewhat unacceptable, 3=neutral, 4=somewhat acceptable, 5=totally acceptable.

Means with different superscripts are statistically different at $^{*}p \leq .05$ or $^{**}p \leq .005$.

expressive activity groups, hunters, horse riders, and scouts agreed 100 percent of the time. Hikers agreed with hunters 100 percent of the time and with horse riders on 80 percent of the responses, but with scouts only 40 percent of the time. Overall, these four groups agreed on 26 (87%) of 30 possible comparisons, lending substantial support to the first hypothesis.

Hypothesis 2 involves comparing the conservation group with the four outdoor activity groups and anticipates differences will exist. The Sierra Club members agreed with the activity groups on 13 (81%) of 16 comparisons at the four lower impact levels, but differed substantially on all four comparisons in the *severe* category. Overall, then, Sierra Club members agreed with the four activity groups on 13 (65%) of 20 possible comparisons, giving reason to question the second hypothesis.

Hypothesis 3 predicted differences between horsepackers and hikers. As a group, horsepackers differed from the hiker group on only 1 (20%) of 5 possible comparisons, giving cause to doubt this hypothesis.

Managers are the group most often different from others. Overall, they differed from the user groups on 15 (60%) of 25 possible comparisons. This provides qualified support for the last hypothesis.

Fire Rings. Fire ring mean acceptability ratings are given in Table 2. As a group, hunters rated *no fire* ring

Table 2

Acceptability Ratings for Fire Ring Impacts

Fire Ring Impact (Inch)	Group Mean Scores						F Value
	Hunters	Horse Riders	Scouts	Hikers	Sierra Club	Managers	
None	2.6^{ab}	2.1^{a}	2.9^{bc}	3.3^{c}	4.0^{d}	4.4^{d}	17.1^{**}
Moderate (15-25)	3.3^{b}	3.0^{ab}	3.1^{ab}	2.9^{a}	3.0^{ab}	3.7^{c}	7.6^{*}
Heavy (35-40)	3.6^{c}	3.2^{bc}	3.2^{bc}	3.0^{b}	2.6^{a}	3.0^{b}	4.2^{*}
Severe (70+)	3.0^{d}	2.8^{cd}	2.3^{bc}	1.9^{b}	1.3^{a}	1.4^{a}	17.0^{**}

Scores based on five point scale: 1=totally unacceptable, 2=somewhat unacceptable, 3=neutral, 4=somewhat acceptable, 5=totally acceptable.

Means with different superscripts are statistically different at $^{*}p \leq .05$ or $^{**}p \leq .005$.

as somewhat unacceptable (2.6), but rated all other impacts as neutral or better. Horse riders are also critical of *no fire* ring (2.1) and judged all other impacts close to mid range. Scouts and hikers found only the *severe* level unacceptable (2.3 & 1.9, respectively), with lesser impacts near the neutral point. Again, the Sierra Club and manager ratings decreased with increases in the level of impact. The Sierra Club rated the *no fire* ring option high (4.0), with managers even higher (4.4). Both groups rated the *severe* impact close to totally unacceptable.

In order to assess agreement levels between groups, ANOVA was employed to test for significant differences ($P \leq .05$) in fire ring scores. Among the four activity groups, hunters and horse riders agreed 100 percent of the time, as did scouts and hikers. Horse riders and scouts agreed 75 percent of the time, but hunters and hikers did not agree at all. Overall, the four groups agreed on 16 (67%) of 24 possible comparisons, giving qualified support for the first hypothesis.

Hypothesis 2 predicted differences between the activity and conservation groups. The Sierra Club members differed significantly from the activity groups on 12 (75%) of 16 overall comparisons, giving qualified support for the second hypothesis.

Hypothesis 3 involved comparing horse riders with hikers. The groups agreed on 2 (50%) of 4 comparisons,

giving reason to question the notion that hikers and horse riders are significantly different.

Managers' views continue to give some credibility to the fourth hypothesis. As a group, managers differed from user groups on 15 (75%) of 20 possible comparisons, agreeing with only the Sierra Club on more than one occasion.

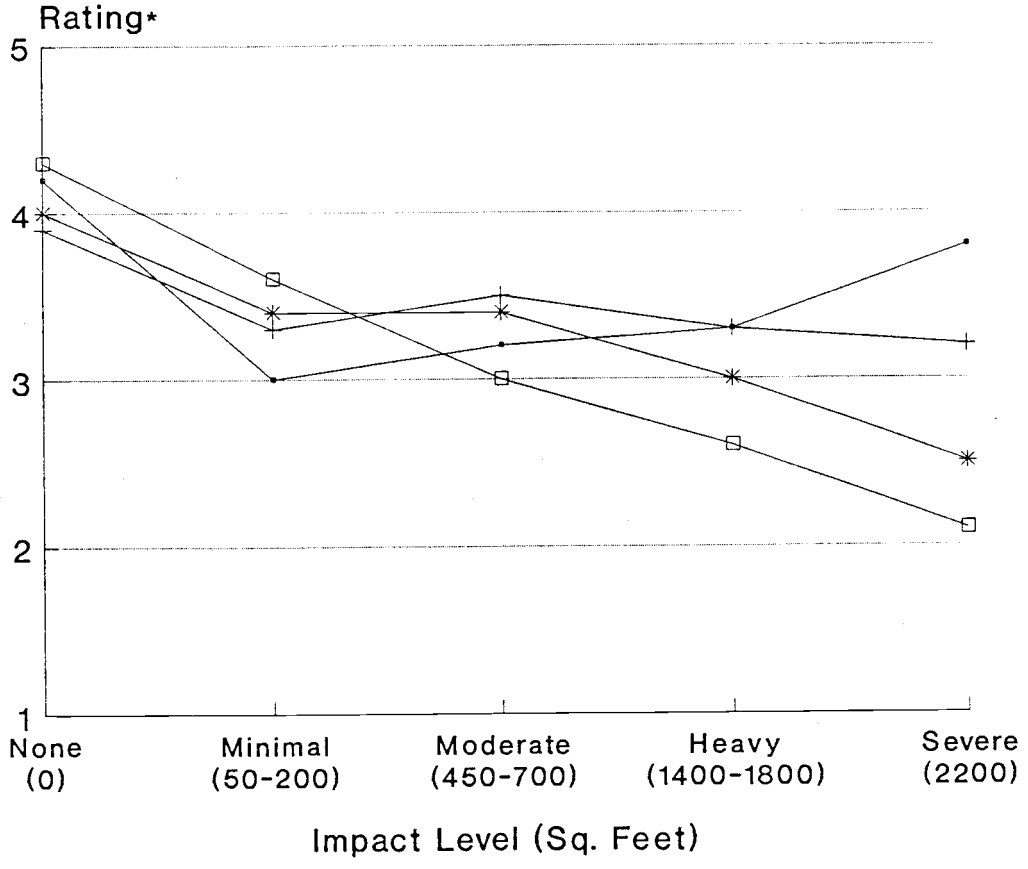
Summary. The examination of group norms can be simplified through use of acceptability curves for both bare ground and fire ring impacts. In the case of bare ground, means from Table 1 suggest consolidation of the original six group types into four groups for visual evaluation (Figure 1). Because of their 100 percent agreement rate, it is reasonable to consolidate hunters, horse riders and scouts into a single group. Although similarities exist, hikers are plotted separately. Sierra Club members and managers are also maintained as separate groups.

Figure 1 suggests two interesting conclusions. First, the shapes of the curves are different. The Sierra Club and managers have downward-sloping curves, where ratings fall as impacts increase. In contrast, the curves of the three combined activity groups slope downward from *no impact* to *minimal* impact, but then move upward with higher ratings as the amount of bare ground increases. Second, on average most of the bare ground impacts studied here are

Figure 1

Bare Ground Impacts

Group Acceptablility Ratings



* 1= Totally unacceptable
2=Somewhat unacceptable
3=Neutral
4=Somewhat acceptable
5=Totally acceptable

rated as acceptable (above the neutral line). All four curves are at or above the midline through the *moderate* impact level. Managers drop below the line for *heavy* impacts, and Sierra Club members join them for *severe* impacts.

Acceptability curves for fire rings are shown in Figure 2. Based on agreement levels from Table 2, hunters and horse riders are shown as a consolidated group, as are scouts and hikers. Sierra Club members and managers are plotted separately. As with bare ground ratings, the curves for fire rings are shaped differently. The Sierra Club and managers have downward-sloping curves where ratings fall as levels of impact increase. In contrast, the curve for hunters and horse riders depicts *no fire* ring as unacceptable, the *moderate* and *heavy* rings as increasingly acceptable, and drops just below the neutral line for the 73 inch ring. The curve for scouts and hikers has a comparable shape, but with higher ratings for *no fire* ring and lower ratings for the *severe* fire ring.

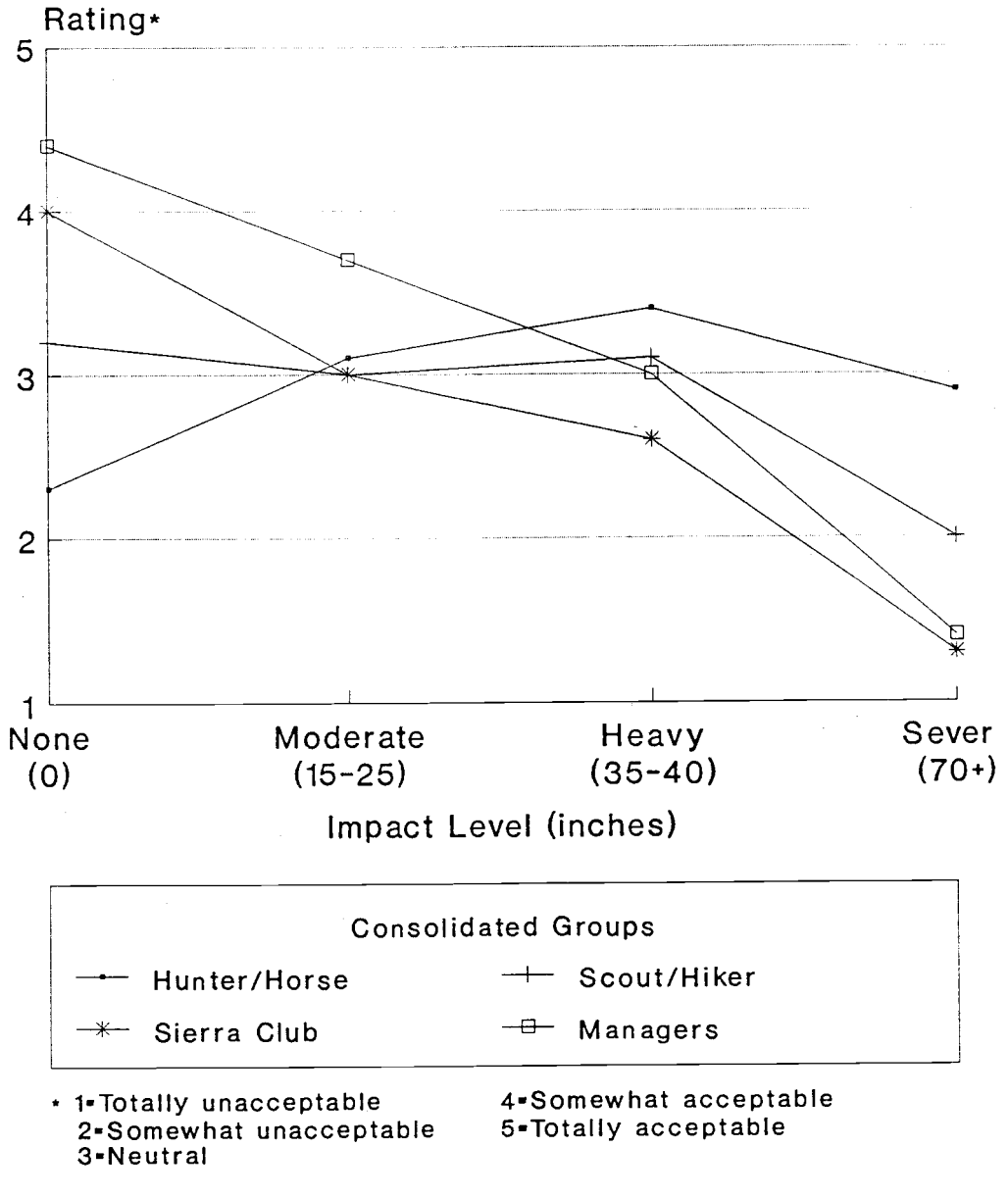
DISCUSSION

The primary purpose of this paper was to examine the differences and similarities in group norms for bare ground and fire ring impacts at campsites. Four hypotheses were proposed to evaluate the norms of activity clubs, conservation groups, and backcountry managers.

Figure 2

Fire Ring Impacts

Group Acceptability Ratings



* 1=Totally unacceptable
2=Somewhat unacceptable
3=Neutral
4=Somewhat acceptable
5=Totally acceptable

The first hypothesis anticipated that the norms of outdoor activity groups would be similar to each other. This hypothesis was made counter to the general assumption that groups have different standards for impacts, which presumably grew out of certain groups registering differences over encounters and crowding levels. Instead we accepted the rationale of Hendee et al., (1969) and Dennis and Zube (1988) that expressive activity organizations share similar motives for conserving the resource for purposes of continued recreation use, and thus should have similar views toward resource impacts. The findings provide evidence to support the hypothesis. Combining bare ground and fire ring evaluations, the four activity groups agree on 42 (78%) of 54 possible impact comparisons. The hunter and horse rider groups were in 100 percent agreement.

In general, the activity groups showed a high tolerance for resource impacts. This is best observed when the sites with no disturbance (*no bare ground* and *no fire ring*) are removed from consideration. Taken together, the four groups studied rated 23 (82%) of 28 impacts as neutral or acceptable, including the most severely damaged sites. Shapes of curves were generally similar, even when differences did exist. Additional similarities can be observed from results of the experiential section of the questionnaire. Overall, 80 percent of respondents prefer a

site with previously established bare ground, and 64 percent prefer a site with an existing fire ring.

The second hypothesis suggested that conservation group norms would be different from those of activity groups, an assumption which was based on previous research. Dennis and Zube (1988) noted that the two groups have different incentives which motivate people to join; Lunch (1987) described these as material goals and ideological causes. Hendee et al. (1969) observed that instrumental conservation groups are more preservation oriented with motives to protect the resource, while expressive activity groups promote resource use. In a discussion of policy decision factors for resource impacts, Hammitt (1987) implies agreement. He contends that those who represent resource interests are more likely to be concerned about impacts that impair the functioning ecosystem, while recreationists are more interested in impacts that interfere with their use of the area's specific attributes.

In contrast to prior research, the present study results are indecisive on this second hypothesis, showing both similarities and differences between the activity and conservation groups. Data for all bare ground impacts indicated 65 percent agreement, while fire ring results showed only 25 percent agreement. The overall agreement rate (47%) suggests the two types of groups may not be as different as initially expected. In addition, 64 percent

of the Sierra Club members preferred sites with existing bare ground, compared to 80 percent of the members of activity groups. Similarly, 53 percent of Sierra Club members preferred an existing fire ring, compared to 64 percent of activity group members. These results neither substantiate nor disqualify the hypothesis. It could be that more Sierra Club members in the Pacific Northwest are inclined to be users of the resource than their counterparts in other regions, thus making them more like members of outdoor activity groups. But it may also mean that other factors are at work here. With relatively high tolerance for impacts demonstrated by all groups, other site selection criteria may be responsible for true differences (or similarities) among the group types.

Hypothesis 3 predicted that the norms of hikers would be significantly different from those of horsepackers. This would seem incongruous with the first hypothesis where general similarities among activity groups were predicted, but with little research to draw on, we were swayed in this case by the limited comparisons of Stankey (1973, 1980) and Lucas (1980, 1985). Both authors observed differences among hikers and horsepackers, particularly in the number of complaints of one group about the other and their views towards management restrictions in wilderness. In spite of this, they also recorded areas of group agreement (i.e. inappropriateness of large parties, and degree of

deterioration in the Bob Marshall Complex), leaving considerable room for speculation in the specific area of ecological impacts. In comparing the two groups we found agreement on six (67%) of nine impact levels, and in general, a high tolerance for existing impacts. A majority of both hikers and horse users prefer a site with previous bare ground (81% and 76% respectively) and an existing fire ring (54% and 76% respectively), although the latter figures imply some differences of opinion on campfires. Overall, the results indicate more agreement than disagreement, suggesting that the norms of these two groups may not be as different for ecological impacts as they are for other impacts.

The final hypothesis predicted that the opinions of managers would differ from those of user groups, a viewpoint which has been well documented even recently (Marion & Lime, 1986; Martin et al., 1989). Results show that in 67 percent of the possible impact comparisons, managers and user groups disagree. Managers were also the group least likely to prefer a site with an existing fire ring (53%) or an established area of bare ground (49%). In a recent study of similar criteria (Martin et al., 1989), managers and visitors were also found to have differing evaluative standards for ecological impacts. It was reported that managers had significantly stricter standards for bare ground, but users had higher standards for fire

rings. Both groups appeared to more strictly evaluate the acceptability of impacts overall than in the current research. However, the previous study lacked quantitative data on impact levels and used different sampling methods, making comparison of results difficult.

In other research, Marion and Lime (1986) credit resource managers with a broader awareness of and greater sensitivity to ecological impacts than visitors. Formal technical training and extensive experience with natural environments make managers more perceptive than recreationists who often fail to notice resource deterioration. The views of managers indicate they are the most preservation-minded group studied, although overall the Sierra Club was closely aligned with them. In order to "sell" their management plans to their user constituencies, managers may have to either modify their management standards to fit with those of users, or convince users that managers' standards make the most sense.

CONCLUSIONS

The findings presented here suggest three interesting conclusions. First, *for most user groups, all but the most severe impact levels studied here were considered acceptable*. These results are not substantially different than those found for individual visitors at specific locations. Lucas' (1980) study of use patterns at nine wilderness areas shows many impacts go unnoticed; and those

that are, are not necessarily viewed negatively. Other researchers report similar conclusions (Frissell & Duncan, 1965; Heberlein & Dunwiddie, 1979; Cole, 1982; Shelby et al., 1988); most wilderness users do not object to camping on disturbed sites, and they often choose campsites with substantial "wear and tear." The only qualification suggested by the present study is that in bare ground evaluations all groups gave their highest rating to the campsite with no bare ground at all, which was an area of undisturbed grass. This suggests that users may *prefer* impact levels lower than those they will *tolerate*.

This raises the question of whether impacts such as bare ground and fire rings actually attract users to campsites. Clark and Stankey (1986) argue that a campsite is defined by features or attributes that can be categorized as facilitators/attractors and constrainers/ detractors. Shelby et al. (1988) speculated that bare ground and fire rings might actually help identify a campsite and preclude the user from causing additional impact, thus making these impacts attractive to users. In the present study, users were asked if they preferred a site with a previously established area of bare ground or an existing fire ring to help resolve this issue. Most (80%) indicated agreement. Of these, 92% said they preferred a site where these changes had already occurred so that their presence would create no additional impact.

It thus appears that these impacts may be detractors when they are at severe levels, while at moderate levels they are simply neutral. At low levels the lack of impacts may be an attractor.

Second, *other attributes of campsites may be more important to users than levels of ecological impacts*. It seems clear that users will continue to camp at sites with substantial resource impacts; the question is, *why*? In a study of campsite choice by whitewater boaters, Brunson and Shelby (1990) found that campsite characteristics could be divided into necessity, experience, and amenity attributes. Users select sites with necessities such as flat ground for sleeping, then choose among them based on experience attributes such as screening from other parties or amenity attributes such as the presence of a view. It may be that the amount of bare ground or the size of a fire ring are low priority attributes compared to other site characteristics. For example, many backcountry settings have relatively few sites with good flat spots for tents. In choosing among these, users may place greater importance on social concerns such as isolation from other parties than on ecological concerns about the amount of bare ground. This suggests that existing impacted sites may be where they are for good reasons and that visitors will probably continue to use these sites, in spite of heavy

resource impact, because they are the best places to camp. This is an area which warrants further work.

Finally, *the different shapes of the impact acceptability curves probably reflect differences in the use characteristics, desired experiences, or conservation philosophy of these groups.* For example, the bare ground curves for managers and Sierra Club members are generally downward sloping, reflecting the conservationist view that "the greater the impact the less acceptable it is." In contrast, most of the curve for hunters, horse riders, and scouts is upward sloping, showing higher ratings as one goes from the minimum impact to severe impact sites. This probably results from the greater space needs of these groups (larger group sizes for scouts, and the need to accommodate stock for the hunters and horse riders). Similarly, the fire ring acceptability curve for hunters and horse riders rates no fire ring as unacceptable, and the next two size categories receive increasingly higher ratings. This probably reflects the greater importance of a fire as part of a more traditional wilderness experience, and perhaps even a preference for a large fire rather than a small one. Because these explanations are clearly speculative, this is another area that warrants further work.

III. GROUP EVALUATIONS OF SOCIAL AND ECOLOGICAL SITE ATTRIBUTES AND MANAGEMENT ACTIONS

INTRODUCTION

Extensive use of wilderness campsites has generated concern among managers over both the ecological consequences of resource change and how it influences the quality of the recreation experience enjoyed by visitors. The National Forest Management Act requires Forest Service planners to limit and distribute visitor use so that natural wilderness qualities are maintained, while the original wilderness legislation guarantees public access. Consequently, publicly acceptable restoration measures have become a priority target of most wilderness plans, particularly in popular areas where substantial use continues.

Public support for management programs is important because promoting significant biological change is a lengthy process and site rehabilitation budgets are limited. In addition, users and managers perceptions of resource impacts may vary considerably, and conflicts regarding acceptance of policies are a legitimate concern (Hammitt, 1987). To evaluate whether management actions designed to improve resource conditions will be successful, user patterns and preferences need to be understood (McDonald & Hammitt, 1986).

Managers and researchers have monitored use patterns for years in an attempt to learn more about visitor preferences and resource impacts. There are a number of factors which influence wilderness use and, specifically, campsite selection. One common finding is that backcountry visitors repeatedly camp at sites with substantial resource damage (Heberlein and Dunwiddie, 1979; Cole, 1982; Hammitt and Cole, 1987; and others), often choosing these sites when others with less "wear and tear" are available. A fundamental question is, *why?* It may be that most campers simply do not perceive these conditions as unsuitable (Cole & Benedict, 1983; Cole 1987), or that resource impacts are low priority considerations when compared to other site characteristics. But if site deterioration is not a deterrent to campsite choice, what factors override this particular component in the selection process? In short, which site features are most important to visitors? Further, what types of impact problems must management programs address to receive support from the backcountry constituency? In order to achieve solutions which improve environmental conditions and are publicly supported, these questions should be considered collectively.

This paper has two objectives. The first is to identify the relative importance of ecological and social impacts at wilderness campsites and their relationship to other campsite selection criteria. Managers can take steps

to improve ecological and/or social conditions, but different impacts require different strategies. Analysis of users' priorities for impact problems can help provide managers with a range of suitable alternatives.

The second objective is to assess visitor support for management policies which could be implemented to keep impacts within acceptable limits. Solving problems may require restrictions on resource use and social activity in popular areas, although a variety of actions are possible. The acceptability of management programs is important since public support will ultimately determine their effectiveness.

These objectives are addressed through the evaluation of wilderness interest group ratings of campsite characteristics and selected management policies. User groups provide a valuable source of feedback on resource issues (see discussion of the role of organized groups in Shindler, 1990), and consulting them is a practical method of assessing the backcountry constituency. Although the emphasis here is on visitor preferences, resource managers have also been included in the sample. Managerial perspectives have traditionally been different from those of users (Hendee & Pyle, 1971; Lucas, 1979; Downing & Clark, 1979), but comparing attitudes of managers and their clientele continues to provide useful information. This is particularly true as the employee infrastructure of the

Forest Service changes and the need to work with interest groups becomes a functional part of resource planning (USDA, 1988). It is generally agreed that a synthesis of managers' perceptions with those of the user public will lead to better management decisions.

BACKGROUND

Research on preferences for wilderness campsite characteristics and user support for management programs has previously been conducted on each topic independently. Both have become significant issues in recent years as concern over impacts has increased. A review of several relevant studies will help provide a context for the current research.

Campsite Selection Criteria

Studies of campsite choice usually involve a discussion of the site's attributes in an effort to gain understanding of what attracts people to recreation settings. Attributes are described by Clark and Stankey (1986) as the characteristics or qualities of a site, such as the opportunity for solitude or the presence of trees, wildlife, or scenery. Site qualities are judged from the user's point of view, given the extent to which they contribute to a desired activity.

Clark and Stankey (1986) organized the attributes of recreation settings for several purposes. In one approach, they classified site attributes as either facilitators

(attractors) or constrainors (detractors), acknowledging qualities which either increase or limit visitor satisfaction. Although the assessments are made by each recreationist, one can readily visualize features that fit these descriptions. Attractors could be good scenery, solitude, or a flat tent site, while detractors might be polluted water, lack of privacy, or resource damage. Clark and Stankey (1986) employed two additional categories to help describe the relative importance of site characteristics in the choice process. They used the term *requisite* attributes to describe those features which are essential to the recreation activity. Examples cited include flat ground for camping and water for boating. Other features which are desirable but not required for the recreation experience, are called *supplementary* attributes. The premise is that this latter group of attributes may influence the choice process, but to a lesser degree because they are not critical to the activity itself.

Brunson and Shelby (1990) carried the requisite/supplementary concept a step farther. In a search for common elements among campsite attributes, they compiled a typology of site features from studies of nine different dispersed recreation settings. Their findings resulted in a classification system of 15 common attributes based on the purpose served: *necessity* attributes provide minimum camping requirements (e.g., flat tent site),

experience attributes facilitate preferred outcomes (e.g., solitude), and *amenity* attributes enrich the overall experience (e.g., availability of firewood). This research suggests a hierarchy of attribute importance which provides basic guidelines for campsite selection.

User Support for Management Policies

Extensive use of popular wilderness destinations has outmatched managers' abilities and resources to maintain natural conditions. The lack of proper inventories and campsite condition data, difficulty in accessing sites for rehabilitation, and insufficient research on ecological impacts are a few reasons why managers have been unable to adequately respond to restoration needs (Cole, 1983; 1987). Being given sufficient tools and data, however, may not be enough. While managers tend to see regulations in terms of implementation and enforcement, users may view them as impediments to their recreation experiences (Lucas, 1979). Managers do not know what management policies their wilderness clientele will accept and honor; users ultimately decide by their actions which policies will be effective in the backcountry. Understanding the importance of site attributes is a critical link in the implementation of expanded management programs, and the success of such programs may depend on which attributes are addressed and how (Clark & Stankey, 1986).

The bulk of research suggests that wilderness visitors may be willing to support increased management action, but their response most likely will be connected with perceptions of how their personal use will be improved. In separate studies of wilderness travelers, Stankey (1980), Anderson & Manfredo (1986) and Shelby, et al. (1989) found that many visitors favor greater regulation in order to protect the resource and the recreation experience, particularly in high-use areas. Manning (1986) reported similar findings in a review of eleven on-site studies of wilderness user attitudes and preferences, but cautioned against generalization of results because of the site-specificity issue. Managers have registered similar concerns over intensively used areas. A comprehensive survey of wilderness managers by Washburne and Cole (1983) shows that managers perceive a wide range of resource problems nationwide.

Although there appears to be a consensus among users and managers that action is needed, answers are not quite so clearcut. Differences between manager and visitor points of view are well documented (e.g. Hendee & Pile, 1971; Lucas, 1979; Downing & Clark, 1979). Managers generally view ecological impacts as more significant concerns than do campers (Lucas 1979; Marion & Lime, 1986; Shindler, 1990), thus site rehabilitation is important to them (Washburne & Cole, 1983; Cole, 1987). In contrast,

many visitors judge the quality of their experience, particularly at campsites, on the basis of social impacts (Stankey, 1980; Lucas, 1980; Lucas et al., 1985). For them, management actions designed to decrease the number of encounters at camps and surrounding trails may be most important.

Within this spectrum of potential regulation, a number of options are available. However, management's ability to fund, implement, and enforce them is limited, and thus it would be useful to develop agreement on the priority of problems and the desirability of potential solutions.

HYPOTHESIS AND ANALYSIS

This study first addresses specific wilderness campsite attributes and attempts to place them in a hierarchial perspective, particularly the attributes over which resource managers have a degree of control. These include ecological characteristics (e.g.the presence of bare ground or fire rings), and social factors which allow opportunities for privacy such as the location of camps in relation to the trail or other sites.

It is hypothesized that social criteria are more important than ecological criteria in campsite selection. Kaplan and Talbot (1983) provide a basis for this supposition. In their studies of wilderness values, they determined that meeting new acquaintances or socializing

with other groups is not central to the wilderness experience; the primary source of visitor satisfaction is the wilderness environment itself. It would follow that freedom from social impacts will be viewed as important. In their update of wilderness research, Lucas, Cole & Stankey (1985) agree with this assessment of social factors, reporting that satisfaction declines as the presence of others goes up. Although campsite resource impacts would seem to generate similar dissatisfaction, previous research indicates otherwise. Numerous studies (e.g. Hendee & Pyle, 1971; Heberlein & Dunwiddie, 1979; Kania, 1986) show that wilderness campers often choose deteriorated or heavily used sites, even though others may be available. Support for these concepts is also found in Brunson and Shelby's (1990) more specific work on dispersed campsite attributes. Using a system which categorizes common campsite features, their results show that social impacts most often rate as necessity or experience attributes, while ecological impacts are generally amenity attributes.

The second area of interest is visitor support for management policies which control impacts on wilderness camping experiences. Traditionally, indirect strategies (emphasis on influencing or modifying behavior rather than direct regulation) have been the preferred management style for regulating uses in wilderness (Lucas, 1983). In order

to maintain a feeling of freedom, this principle of minimum regulation has been recognized as appropriate for the backcountry (Gilbert, et al., 1972; Hendee, et al., 1977). However, with an increase in resource impacts, direct management practices (which control behavior) have increasingly been endorsed as an effective tool in a variety of recreation settings (McAvoy & Dustin, 1983; Dustin & McAvoy, 1984; Swearingin, 1990). Anderson & Manfredo (1986) assert that for certain wilderness conditions, direct actions are more appropriate and will be more acceptable to visitors than indirect actions. The purpose of the present analysis was to identify patterns of user support for management actions and examine similarities and differences of opinion among types of visitors. Because the wilderness issues considered here are for relatively high use areas, we would expect to find support for more direct regulatory measures.

METHODOLOGY

Data used in this study were a subset of results obtained from a larger project comparing interest group evaluations of wilderness campsites. Six interest groups concerned with backcountry use were surveyed regarding ecological and social impacts, site attributes, management policies, and travel experiences. Included were five local clubs of hunters, horse riders, hikers, explorer scouts, and conservationists (Sierra Club). The sixth group were

resource managers. Initially, the major interest in the study was to determine users' preferences for site attributes and suitable management practices; but since data were also collected at a meeting of Forest Service backcountry managers, this group was included to provide comparisons.

Surveying user groups not only provides useful feedback on resource questions, but also allows documentation of similarities and differences among wilderness constituencies. If results show agreement among groups, additional credibility will accrue to the findings; if there are differences, managers can use this information to better accommodate user concerns. Groups were selected from Oregon's Willamette Valley and data were collected utilizing a self-administered questionnaire. Each group was surveyed during a portion of a regular membership meeting, with a 100 percent response from those present. Sample sizes were: scouts (30), hunters (33), horse riders (40), Sierra Club (55), hikers (77), and managers (91) for a total sample of 326 group members. An additional eleven respondents who had never been to a designated wilderness were removed from the analysis.

Site Attributes

To assess the importance of campsite attributes, respondents were given a list of 15 elements of a wilderness campsite. Within the list, the following

attributes were included as representative of ecological and social attributes:

Ecological Attributes	Social Attributes
- *amount of bare ground*	- *good distance from trail*
- *size and appearance of fire ring*	- *screened from other sites*
	- *out of sight/sound others*
	- *no evidence of litter*

The remaining nine attributes were either physical or experiential in nature and were included to determine their relative importance to social and ecological factors:

Other Attributes
- *view of scenery*
- *available firewood*
- *sheltered from weather*
- *dry and well drained*
- *water for aesthetic reasons*
- *flat place for sleeping*
- *close to good fishing*
- *logs and rocks for seating*
- *close to drinking/cooking water*

Respondents were asked to use a four-point Likert-type scale to rate the importance of each factor in selecting a site (scale values: 1=not important, 2=somewhat important, 3=important, and 4=very important). To measure relative importance, mean ratings for each attribute were calculated for each group. Analysis of variance was used to test for differences between group means.

Management Actions

To determine support or opposition for a series of management alternatives, respondents were asked their opinion on 12 policies which could be implemented in high-use wilderness areas where impacts are perceived to be a problem. Eleven policies were direct control measures,

while a twelfth was a generic option calling for more information on conditions and use levels:

1. *Limit number of people in group*
2. *Limit number of horses in group*
3. *Close campsites for recovery periods*
4. *Close trailheads for recovery periods*
5. *Limit the use of fires to stoves only*
6. *No camping within 200 ft. of lakes*
7. *No dogs in the wilderness*
8. *Close some areas to horses*
9. *Prohibit camping at high impact lakes within three miles of trailhead*
10. *Require a non-fee permit for entry (no limit on permits)*
11. *Set limits on number of users for high impact areas*
12. *Provide more information on trailhead and wilderness conditions and use levels*

Respondents used a five-point Likert-type scale to indicate their support or opposition (scale values: 1=strongly oppose, 2=oppose, 3=neutral, 4=support, and 5=strongly support). Means were calculated for each policy and analysis of variance was used to test for differences between group means.

To see if there were patterns in user support for management actions, factor analysis was used to look for intercorrelation among the responses to the 12 policies. Three separate underlying dimensions, or management themes, were identified, allowing reduction from 12 individual items to three composite scales. Relationships among the composite scales were further examined with analysis of variance.

Finally, ratings of individual management actions were evaluated by comparing percentages of group support

and opposition. The same procedure was then used to evaluate support for the three management themes identified through factor analysis.

RESULTS

Campsite Attributes

To measure the relative importance of the 15 campsite attributes, mean importance ratings were calculated for each group (see Table 3). The attributes are listed in descending order of overall ranking (grand mean), which reflects a weighting toward the Sierra Club and managers because of their larger sample sizes.

Analysis of variance testing ($P \leq .05$) showed few differences between groups. There were four attributes where differences did occur: *screened from others*, *out of sight and sound of others*, *availability of firewood*, and *being close to good fishing*. The first three differences most likely reflect practical distinctions. Less importance placed on *screened from others* by horse riders and *being out of sight and sound* by horse riders and scouts, may be related to their general pattern of traveling with larger groups. Similarly, a greater preference for the *availability of firewood* among hunters, horse riders and scouts seems to indicate a stronger interest in the traditional campfire. The lower rating of this attribute by hikers, Sierra Club members, and managers might reflect a changeover to campstove use or a higher

Table 3

Campsite Attribute Ratings

Attribute	Mean Scores: Grand Mean	Hunters	Horse Riders	Scouts	Hikers	Sierra Club	Managers	F Value
Flat place to sleep	3.5	3.5	3.4	3.5	3.6	3.5	3.5	NS
Dry and well drained	3.4	3.2	3.4	3.3	3.4	3.3	3.4	NS
View of scenery	3.3	3.3	2.9	3.3	3.3	3.4	3.2	NS
Screened from others	3.2	3.2^{abc}	2.8^{a}	3.0^{ab}	3.0^{ab}	3.4^{bc}	3.6^{c}	9.1^{*}
Out of sight and sound	3.1	3.1^{ab}	2.6^{a}	2.7^{a}	3.0^{ab}	3.4^{b}	3.4^{b}	9.4^{*}
No evidence of litter	3.1	3.2	3.2	3.2	3.3	3.3	2.8	NS
Close to drinking water	3.0	3.2	3.2	3.2	3.0	2.9	2.7	NS
Sheltered from weather	2.8	3.0	2.8	3.1	2.8	2.9	2.7	NS
Distance from trail	2.6	2.3	2.7	2.6	2.5	2.8	2.7	NS
Water for aesthetics	2.6	2.4	2.3	2.6	2.5	2.7	2.7	NS
Available firewood	2.3	3.0^{b}	2.8^{b}	2.7^{b}	2.0^{a}	1.9^{a}	2.0^{a}	11.4^{**}
Amount of bare ground	2.3	2.1	2.2	2.5	2.3	2.3	2.4	NS
Size/appear. of fire ring	2.3	2.1	2.4	2.6	2.4	2.0	2.2	NS
Logs/rocks for seating	2.0	2.1	2.2	2.2	2.3	1.9	1.8	NS
Close to good fishing	1.8	2.3^{b}	1.7^{ab}	2.3^{b}	1.4^{a}	1.4^{a}	1.9^{b}	10.3^{**}

Scores based on four point scale: 1=not important, 2=somewhat important, 3=important, 4=important.

Means with different superscripts are significantly different at $^{*}p \leq .05$ or $^{**}p \leq .01$.

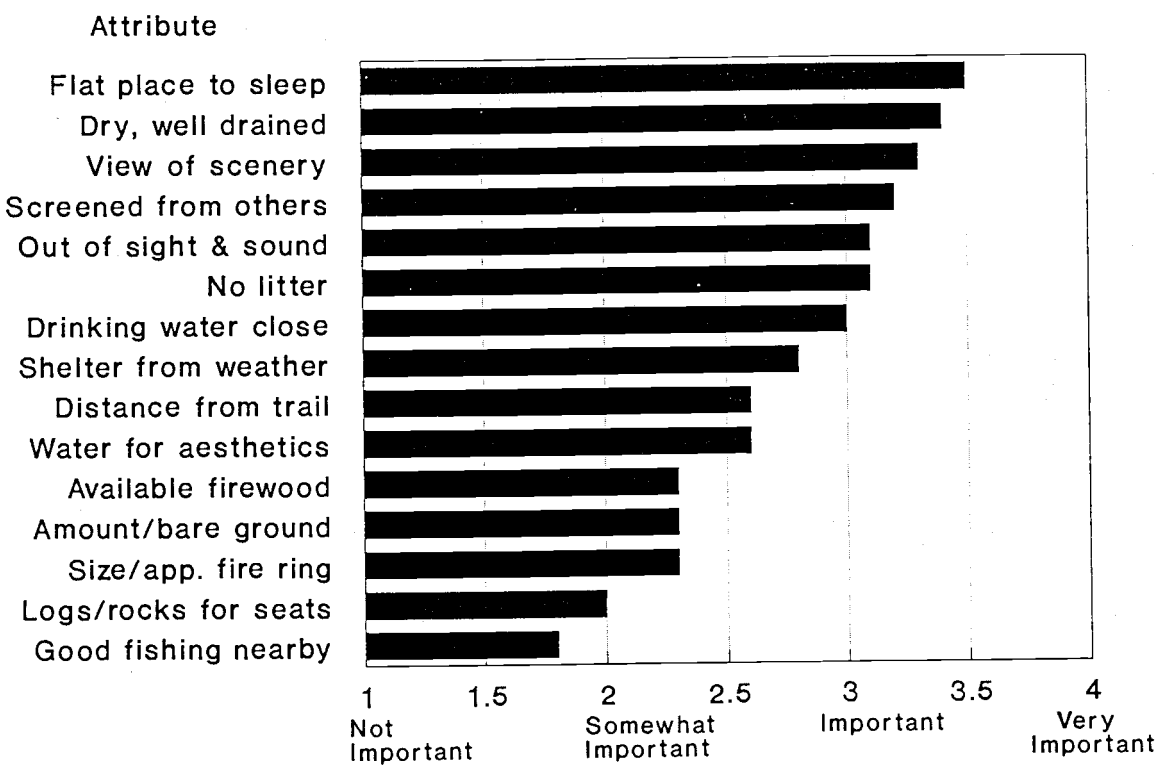
level of wilderness day use on the part of these groups. The fourth difference, *being close to good fishing*, is so activity dependent and low rated overall, that it does not seem to be an important consideration. In summary, there was agreement on 202 (90%) of 225 possible comparisons between all groups, and high (97%) agreement among nonmanagers for the 10 most important attributes. It makes sense to combine the group scores and look at rankings for the sample as a whole.

Aggregate ratings are presented in Figure 3. The results show that ten of the attributes were considered "important" or "very important," with means above the scale midpoint of 2.5. The hypothesis predicted that social attributes would be rated more important than ecological attributes. The attributes which were considered social in nature, *screened from others* (3.2), *out of sight and sound of others* (3.1), *no evidence of litter* (3.1), and *distance from the trail* (2.6), were all rated as important site selection criteria. The ecological based attributes, *amount of bare ground* (2.3) and *size and appearance of fire rings* (2.3), were ranked further down the list, below the scale midpoint. These findings provide considerable support for the hypothesis.

Figure 3

Wilderness Campsite Attributes

Aggregate Group Ratings
(Mean Scores)



Management Policies

Levels of support for the 12 proposed management actions are shown as group means in Table 4. A mean of 3.5 or above indicates support for a policy. According to the ratings, two policies, *close sites for recovery* and *provide more information on trailhead and wilderness conditions and use levels*, were supported by all groups. Two others, *close trailheads for recovery* and *limit the number of users,* were supported by all but the horse riders. Overall, the ratings are generally high, particularly among the hikers, Sierra Club members, and managers. These three demonstrate consistently greater preference for controls than the other groups across all management options.

ANOVA testing for differences in group means shows that significant differences ($P \leq .05$) exist; there was complete (100%) agreement on only one policy - *provide more user information*. However, subsets of agreement can be found. Hunters and scouts agreed on all 12 policies, with horse riders diverging only on the two specific horse related issues. A second subset, made up of hikers, Sierra Club members, and managers, also registered agreement on all 12 policies.

In order to look for patterns in support of management policies, a principle components extraction technique was used in factor analyzing all responses. Using varimax rotation and minimum eigenvalues of 1.00,

Table 4

Management Policy Support Ratings

Mgt. Policy	Group Mean Scores						F Value
	Hunters	Horse Riders	Scouts	Hikers	Sierra Club	Managers	
Limit people in group	3.4^{a}	3.2^{a}	3.6^{ab}	4.1^{b}	4.1^{b}	4.1^{b}	9.9^{*}
Limit horses in group	3.6^{b}	2.9^{a}	3.5^{b}	4.6^{c}	4.4^{c}	4.3^{c}	25.2^{**}
Close sites for recovery	3.8^{a}	3.8^{a}	3.8^{a}	4.3^{b}	4.5^{b}	4.4^{b}	6.8^{*}
Close t/heads for recovery	3.8^{ab}	3.0^{a}	3.6^{ab}	3.9^{b}	4.1^{b}	3.9^{b}	6.5^{*}
Limit fires to stoves only	2.4^{a}	2.2^{a}	2.7^{a}	3.7^{b}	3.8^{b}	3.4^{b}	15.4^{**}
No camps w/in 200' of lakes	3.2^{a}	3.1^{a}	2.9^{a}	3.7^{b}	4.1^{b}	4.1^{b}	9.3^{*}
No dogs in wilderness	2.7^{ab}	2.0^{a}	2.8^{ab}	4.0^{c}	3.5^{bc}	3.3^{bc}	14.4^{**}
Close areas to horses	3.4^{b}	1.7^{a}	3.6^{b}	4.5^{c}	4.4^{c}	4.1^{bc}	49.7^{**}
No camps at impacted lakes	3.2^{ab}	2.9^{a}	3.1^{ab}	3.9^{b}	3.9^{b}	3.4^{ab}	8.1^{*}
No fee permit required	3.1^{ab}	2.7^{a}	2.9^{ab}	3.4^{bc}	3.9^{c}	3.4^{bc}	8.5^{*}
Limit number of users	3.6^{a}	3.4^{a}	3.6^{a}	4.2^{b}	4.4^{b}	4.1^{b}	8.0^{*}
Provide more user info.	4.0	4.4	3.9	4.3	4.4	4.5	NS

Scores based on five point scale: 1=strongly oppose, 2=oppose, 3=neutral, 4=support, 5=strongly support.

Means with different superscripts are significantly different at $^{*}p \leq .05$ or $^{**}p \leq .005$.

three factors were identified suggesting three underlying dimensions associated with management controls for this study sample. Multi-item scales were created to represent each factor (Table 5). Policies became segregated into factors representing actions which regulate (1) type of use, (2) site improvements, and (3) access. These groupings represent general management themes by which to further examine preferences. On a sample-wide basis, policies which regulate site improvements generated the highest level of support, with a mean score of 3.9 on a five-point scale. Means for policies which regulate access (3.8) and type of use (3.6) are also relatively high. Reliability of the three scales is indicated by Cronbach's alpha coefficients. For each factor, there were no significant differences ($P \leq .05$) for the subset of hunters, horse riders, and scouts. The same is true for hikers, Sierra Club members, and managers.

Percentages of support for and opposition to the 12 management actions, grouped by the management themes they represent, are presented in Table 6. Data presented in this manner allow for a more intuitive interpretation of political support for policies. The results reiterate the strong support for all policies by hikers, Sierra Club members, and managers. Only one policy, *limiting the use of fires to stoves,* received substantial opposition, with a majority of hunters, horse riders, and scouts showing

Table 5

Factor Loading of Management Policies

Management Policy	Factor 1 Regulate Type of Use	Factor 2 Regulate Site Improvement	Factor 3 Regulate Access	Mean*
Limit number of people in group	.53	.18	.37	3.6
Limit number of horses in group	.75	.14	.29	
Limit use of fires to stoves only	.70	.32	.36	
No camping within 200' of lakes	.56	.37	.39	
No dogs in wilderness	.86	.13	.02	
Close some areas to horses	.94	.18	.21	
Prohibit camping at high impact lakes 3 miles from trailhead	.57	.26	.24	
Close campsites for recovery	.18	.78	.20	3.9
Close trailheads for recovery	.20	.73	.13	
Require nonfee permit (no limit)	.34	.07	.51	3.8
Set limits on number of users	.33	.20	.56	
Provide more info. on conditions	.03	.13	.57	
Cronbach's alpha	.83	.73	.62	

*Based on sample-wide ratings of each item within factors using 5-point Likert scale (1=strongly oppose, 5=strongly support).

Table 6

Management Policies
Percent of Support/Opposition

Mgt. Policy	Hunters		Horse Riders		Scouts		Hikers		Sierra Club		Managers	
	S[1]	O[2]	S	O	S	O	S	O	S	O	S	O
Type of Use												
Limit people in group	53	22	51	32	55	14	76	3	82	7	88	8
Limit horses in group	56	6	39	39	48	10	93	4	89	2	93	3
Limit fires to stoves only	13	50	13	73	21	51	53	15	65	14	52	31
No camps w/in 200' of lakes	38	25	46	42	28	38	65	17	78	11	79	12
No dogs in wilderness	28	41	12	73	28	45	67	13	53	30	49	30
Close areas to horses	50	22	12	85	66	17	95	3	86	2	74	11
No camps at impacted lakes	31	16	33	38	24	17	67	7	73	9	50	23
Site Improvement												
Close sites for recovery	66	16	70	13	72	10	85	3	96	4	89	4
Close t/heads for recovery	69	9	43	37	48	3	64	11	76	9	70	14
Access												
No fee permit required	28	28	28	41	24	34	44	19	65	7	47	18
Limit number of users	56	19	55	13	64	11	85	5	95	4	81	7
Provide more user info.	66	6	93	2	72	14	87	0	93	4	91	4

[1]Percentage represents sum of respondents who responded "strongly support" or "support."
[2]Percentage represents sum of respondents who responded "strongly oppose" or "oppose."

disapproval. Aside from horse riders objecting to *controls on dogs* and *closures on horses in some areas*, no other policy was opposed by a majority of any group.

In a final summary view, Table 7 reports the percent of each group in support or opposition to the three management themes. Again, policies regulating site improvements and access received majority support from all groups. Those regulating type of use received less support, with the horse riders demonstrating opposition to this category.

DISCUSSION

This paper has looked at visitor evaluations of campsite attributes and management policies with two objectives in mind. First was to examine the relative importance of social and ecological impacts as selection attributes; second was to assess visitor support for management policies which could be implemented to keep impacts within acceptable limits.

The first objective was addressed by a hypothesis which predicted that social criteria are more important than ecological criteria in campsite selection. The intent was to determine if one or both of these attribute types was a significant contributor to campsite choice. Researchers have observed that freedom from social contact and encounters at campsites is an important aspect of a wilderness experience (Lucas, 1964, 1980; Stankey 1973,

Table 7

Management Policy Themes
Percent of Support/Opposition

Policy Theme	Hunters		Horse Riders		Scouts		Hikers		Sierra Club		Managers	
	S[1]	O[2]	S	O	S	O	S	O	S	O	S	O
Type of Use	38	26	29	55	39	27	74	9	75	11	69	17
Site Improvmnt.	68	13	57	25	60	7	75	7	86	7	80	9
Access	50	18	57	19	53	20	72	8	84	5	73	10

[1]Percentage represents sum of respondents who responded "strongly support" or "support" to policies within the composite scale.
[2]Percentage represents sum of respondents who responded "strongly oppose" or "oppose" to policies within the composite scale.

1980; Shelby, 1981). This condition holds true across a variety of settings and use levels and over time (Lucas, Cole & Stankey, 1985). In contrast, resource impacts have continued to go either unnoticed by campers or are reported as insufficient reasons for rejecting a site (Heberlein & Dunwiddie, 1979; Lucas, 1986; Shelby et al., 1988).

The current findings extend previous research by providing a direct comparison of social and ecological attributes in the same data set. All of the study attributes considered to be social in nature received ratings which indicate they are "important" or "very important" to users. These results match those of Shelby and Brunson (1990) who obtained similar ratings for these social attributes in a recent survey of visitors to the Alpine Lakes Wilderness in central Washington. In the present study, the two ecological attributes were rated only as "somewhat important." Shelby and Brunson (1990) found similar ratings, as did Harris (1983) while studying visitors to Oregon's Mt. Jefferson Wilderness. Harris's respondents rated bare ground 10th and fire rings 11th in a ranking of eleven campsite selection criteria. In Clark and Stankey's (1986) attribute rating system, social attributes would probably rank as *requisite*, while ecological attributes would rank as *supplemental*. Similarly, in Brunson and Shelby's (1990) system, social attributes were

experience attributes, while ecological attributes were less important *amenity* attributes.

Additional support for the hypothesis comes from responses to specific questions about acceptable contact levels at wilderness campsites. Regarding how often campers should be able to *see other parties from their site*, 87 percent answered "not at all" or "only occasional glimpses." Similarly, 95 percent felt they should *hear other parties* only "occasionally" or "not at all." There were no significant differences among groups in these responses, suggesting a strong concern about social impacts.

Two interesting points emerge from these results. First, heavily used sites simply are where they are for good reason. In addition to being substantially altered, these sites most probably are flat and dry, provide good scenery, are close to water, and are well located in relation to trail systems and wilderness attractions. Because of this, the sites will continue to be popular unless resource conditions become so intolerable that campers avoid them altogether. It appears that users are very tolerant. In a previous study with these same respondents, the majority of users rated even severe ecological impacts as acceptable for wilderness camping (Shindler, 1990). This might suggest that management efforts will be most productive if directed at some of the

social impacts of greatest concern to users, rather than to minor resource changes.

The second point is that the ecological impacts studied here serve another function. Bare ground and fire rings help identify an acceptable site for many campers (Lucas, Cole & Stankey, 1985). Our respondents share this point of view as 87 percent stated they preferred a site with an existing fire ring or a previously established area of bare ground. Of these, 92 percent checked a response which said *I prefer a site where these changes have already occurred and my presence creates no additional impact.* This suggests that most wilderness travelers may be practicing an ethic in which they recognize a campsite by an identifiable impact and feel it is okay to camp there because they will not cause further resource damage. Considering that these sites are tied to locations with other desirable attributes, rehabilitation of these areas is probably a low priority for most backcountry visitors and continued demand for their use may make rehabilitation difficult or impossible.

The second objective was concerned with identifying patterns of user support for management practices. Overall, ratings were surprisingly high, and three groups - hikers, Sierra Club members, and managers - favored almost all regulatory measures. It should be noted that respondents were asked to consider policies for high use

areas where impacts are a problem, and this context may in part account for the strength of this support. Further analysis brought out several points for consideration.

First, responses emerged as three underlying management themes with slightly different levels of support. Management policies which regulate site improvements and access were well supported by all groups, while support for regulating type of use was less, especially among hunters, horse riders, and scouts. Strong support for site improvement policies is somewhat surprising, particularly in view of the campsite attribute ratings. Perhaps there is greater recognition of environmental damage than users have been given credit for, although our larger study of ratings of specific ecological impacts at campsites indicates otherwise. It may be that users tend to support closures when the sites are general and nonspecific; yet, when faced with the choice of closing a familiar site which has many other preferred attributes, the ecological impact becomes acceptable. The high level of support overall for regulating access seems to indicate a preference for limiting use prior to wilderness entry (e.g. requiring a permit), rather than for regulating types of use which dictates to users what they can do once they get there (e.g. limit use of fires). Similar results were recorded by Anderson and Manfredo (1986) in assessing backcountry users' preference for direct and indirect

controls. Their respondents supported management actions which attempted to protect the overall quality and character of the resource, but opposed measures which restricted behavior within an area. In the present study, controlling types of use was not well received by hunters, horse riders, and scouts. Their message seems to be "we are not opposed to some limitations placed on wilderness, but we prefer to have unrestricted use once we are in the backcountry."

The second issue is the level of neutrality in certain responses. Neutral answers were particularly high for hunters and scouts (32% of all responses). One policy, *require a non-fee permit for entry (no limit)*, generated a 36 percent neutral response from all groups. This level of neutrality could indicate general acceptance of a policy, meaning respondents truly do not care; or it may mean they actually do not know how they feel. This point is important to managers in how they plan and implement management programs which require user acceptance. Hammitt and Cole (1987) indicate that users will generally support regulatory measures if they are viewed as necessary to prevent overuse. With a high percentage of responses in the neutral category, and the potential for user opinion to move to either side of an issue, effective presentation of management programs is important.

A third point is the use of direct management controls in the survey instrument. These measures were introduced to test the strength of user support for increased management action. While indirect tactics are still appropriate, it is clear that many users are willing to support direct strategies to improve the quality of their recreation experience in heavily impacted areas. This view is shared by Hammitt, McDonald, and Cordell (1982) and Anderson and Manfredo (1986), who observed that visitors who perceive impacts as a problem are more supportive of direct management action. This research reiterates the need for clear management communication of resource impacts and planned management strategies.

In a final consideration, this study of management policies looked at similarities and differences in the opinions of interest groups. By their responses, the six original groups separated themselves into two subgroups for comparison. The hunters, horse riders and scouts, were generally less supportive of management policies than the grouping of hikers, Sierra Club members, and managers who appear more conservation oriented. A similar distribution occurred when these same groups rated ecological impacts at campsites (Shindler, 1990). In this research, hunters, horse riders, and scouts generally recognized fewer site impacts, and were more tolerant of them. Thus, as their scores on preference for management action suggest, these

groups probably feel less need for controls or expanded management programs.

An encouraging note for managers is the agreement among groups identified in the present research. The findings suggest that at least for the sample groups, managers are already well aligned with two large conservation-oriented segments of the user constituency. It also appears that the interests of three other groups can be addressed, possibly as a single unit. These results are similar to the previous findings on ecological impacts at campsites (Shindler, 1990) in that they may help reduce the number of groups managers need to consider, making resource decisions simpler.

CONCLUSION

Data on user preferences for campsite attributes can assist managers in evaluating the consequences of change in the backcountry. The current research indicates that the presence of social and ecological impacts play a role in the campsite selection process and each has a different level of importance for visitors in their enjoyment of the resource. Clark & Stankey (1986) recognized that such information on attributes is essential in developing strategies to prevent or mitigate undesirable impacts. User support of management programs may be closely linked with which attributes are affected by regulatory action. A second line of research could follow to determine if

policies which address specific concerns shared by a majority of users can help foster acceptance of other necessary, but less popular measures.

This study has helped demonstrate that organized groups can provide useful feedback to aid in the evaluation of resource problems. Although a variety of groups presently use the wilderness resource, the research suggests that there is solid agreement among subgroups of users for the issues examined. Identifying where consensus exists can help managers find the most appropriate and publicly acceptable solutions for impact problems.

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[1]Citation refers to the first paper in this thesis. This technique seems to be the most suitable method for referencing these findings in the text of the second paper.

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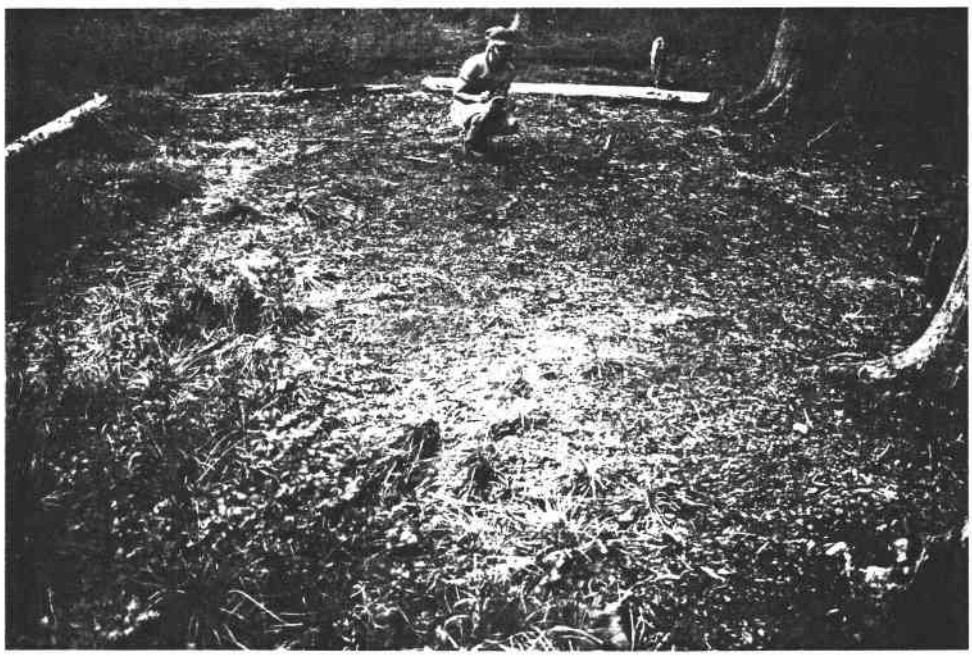
APPENDICES

APPENDIX A

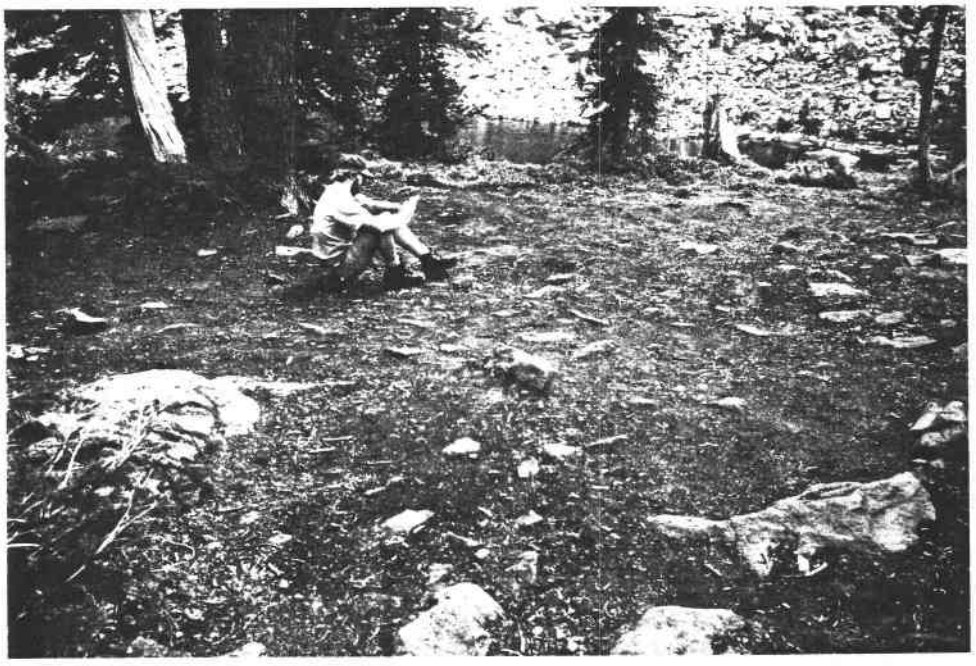
PHOTOGRAPHS OF IMPACTS

USED IN EVALUATIONS

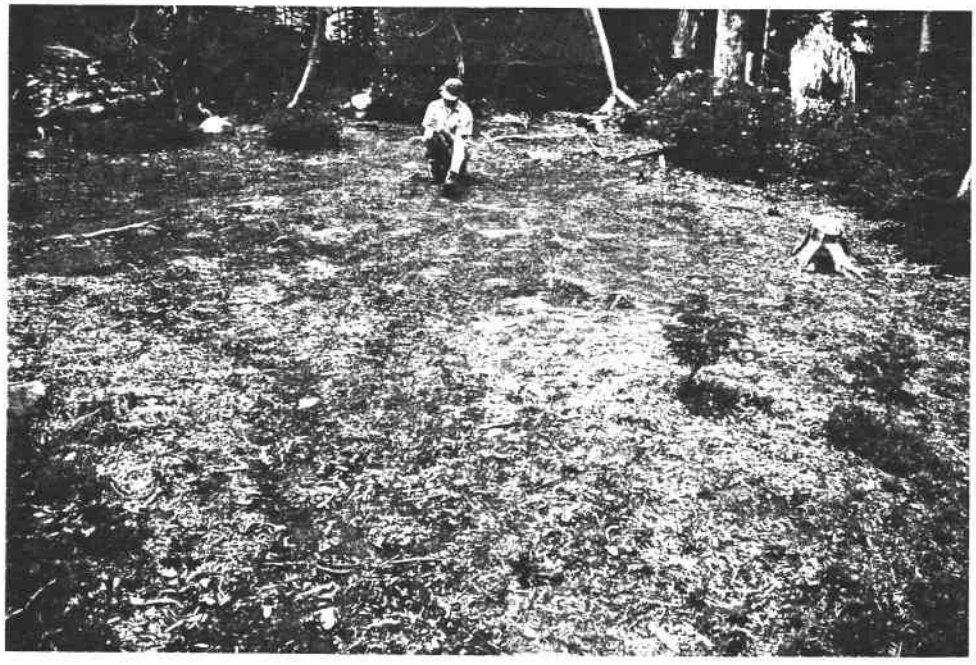
Site 1 Bare Ground

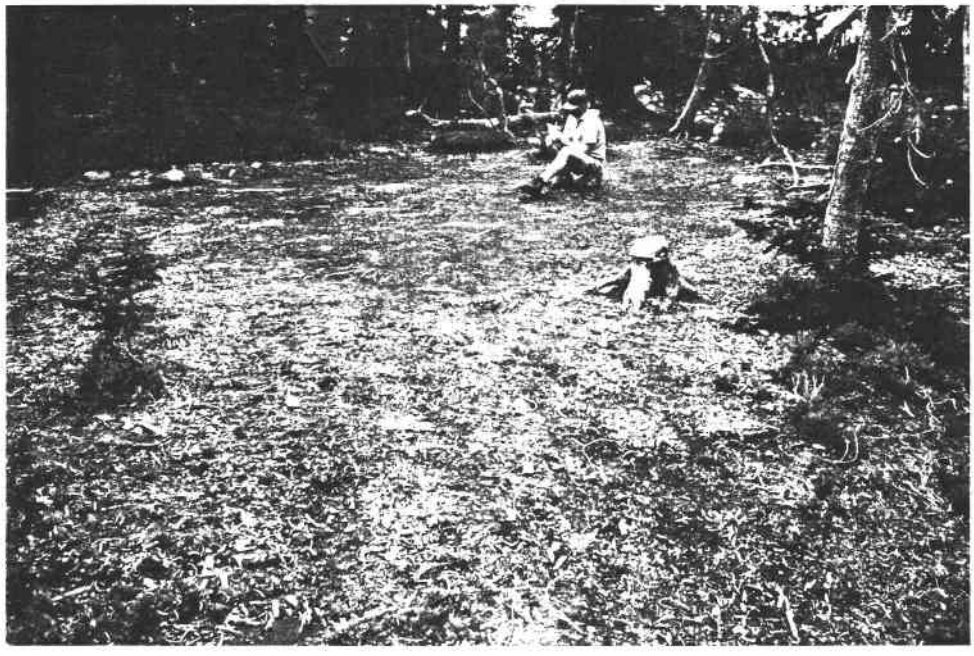


Site 2 Bare Ground



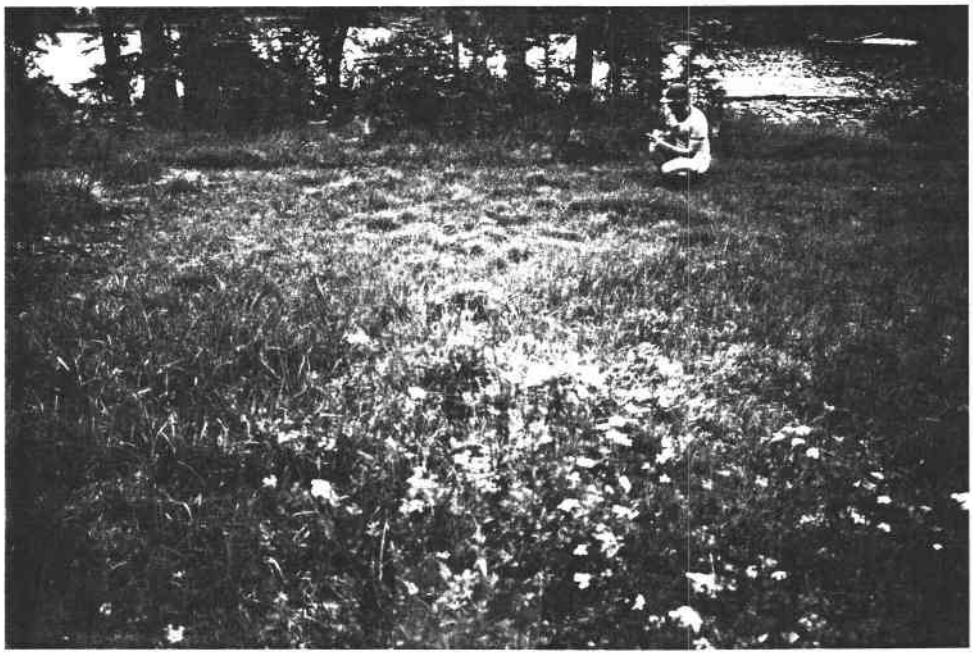
Site 3 Bare Ground



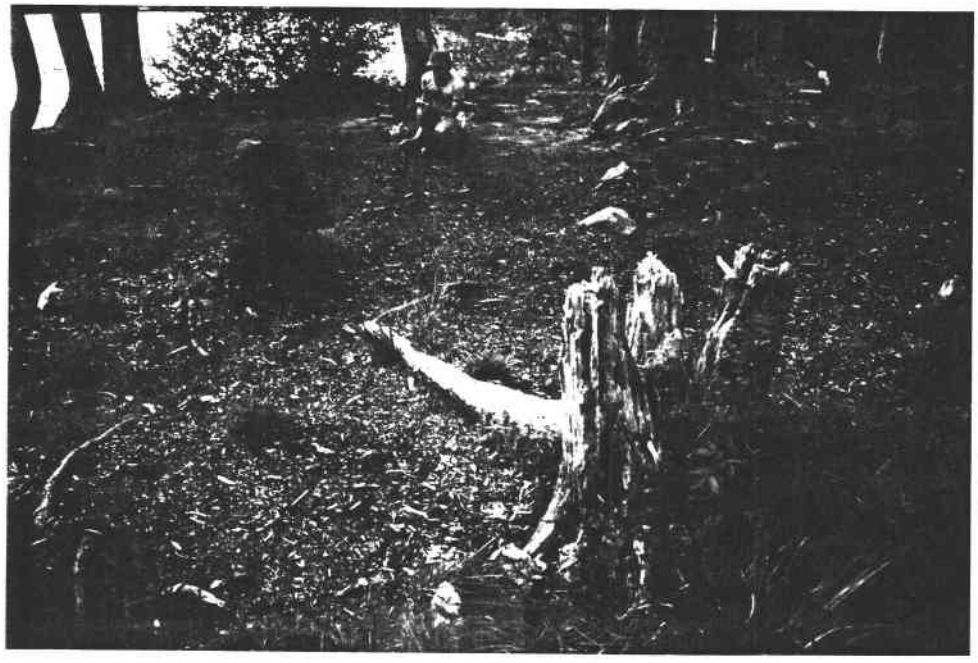


Site 4 Bare Ground

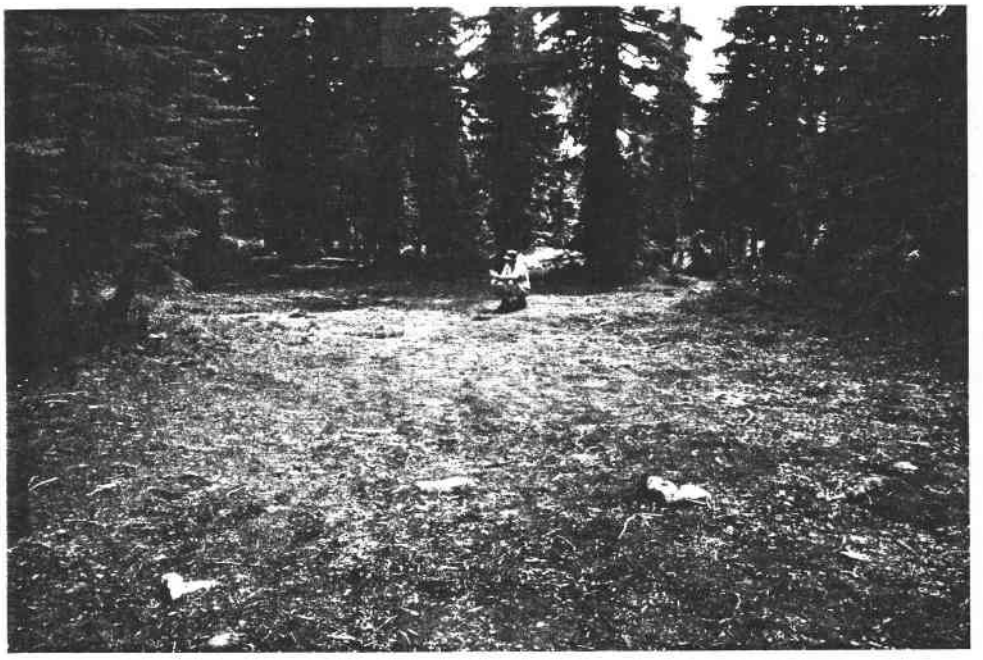
Site 5 Bare Ground



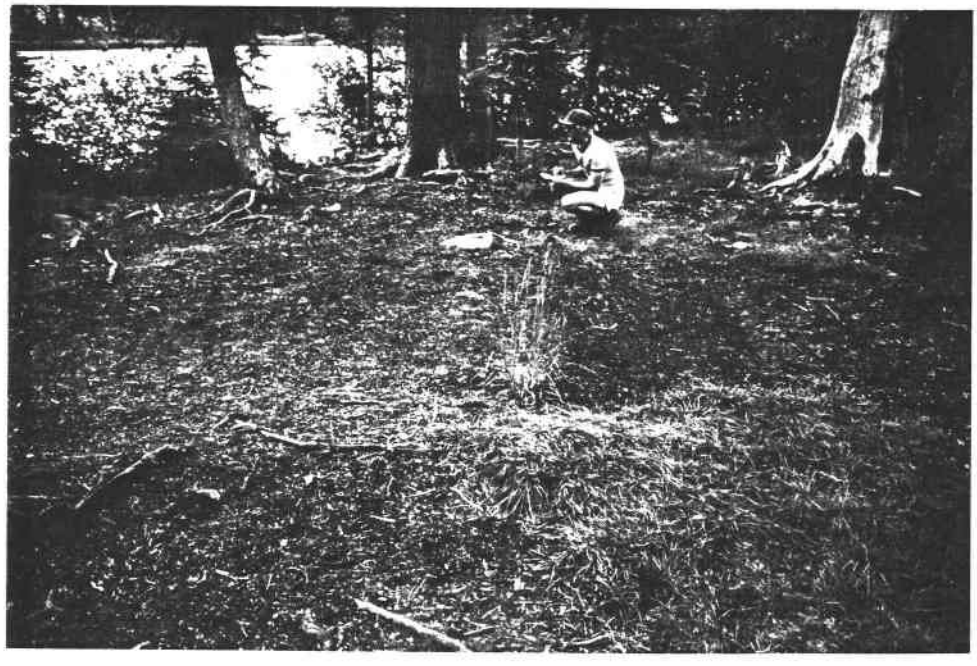
Site 6 Bare Ground



Site 7 Bare Ground



Site 8 Bare Ground



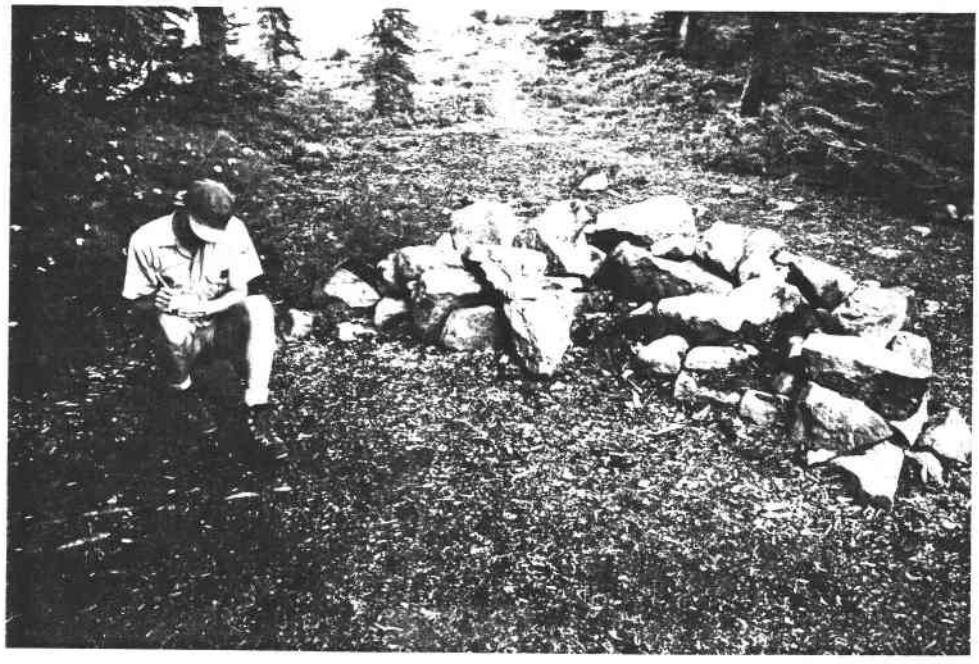
Site 9 Bare Ground

Site 10 Bare Ground

Site 11 Fire Ring

Site 12 Fire Ring

Site 13 Fire Ring



Site 14 Fire Ring

Site 15 Fire Ring

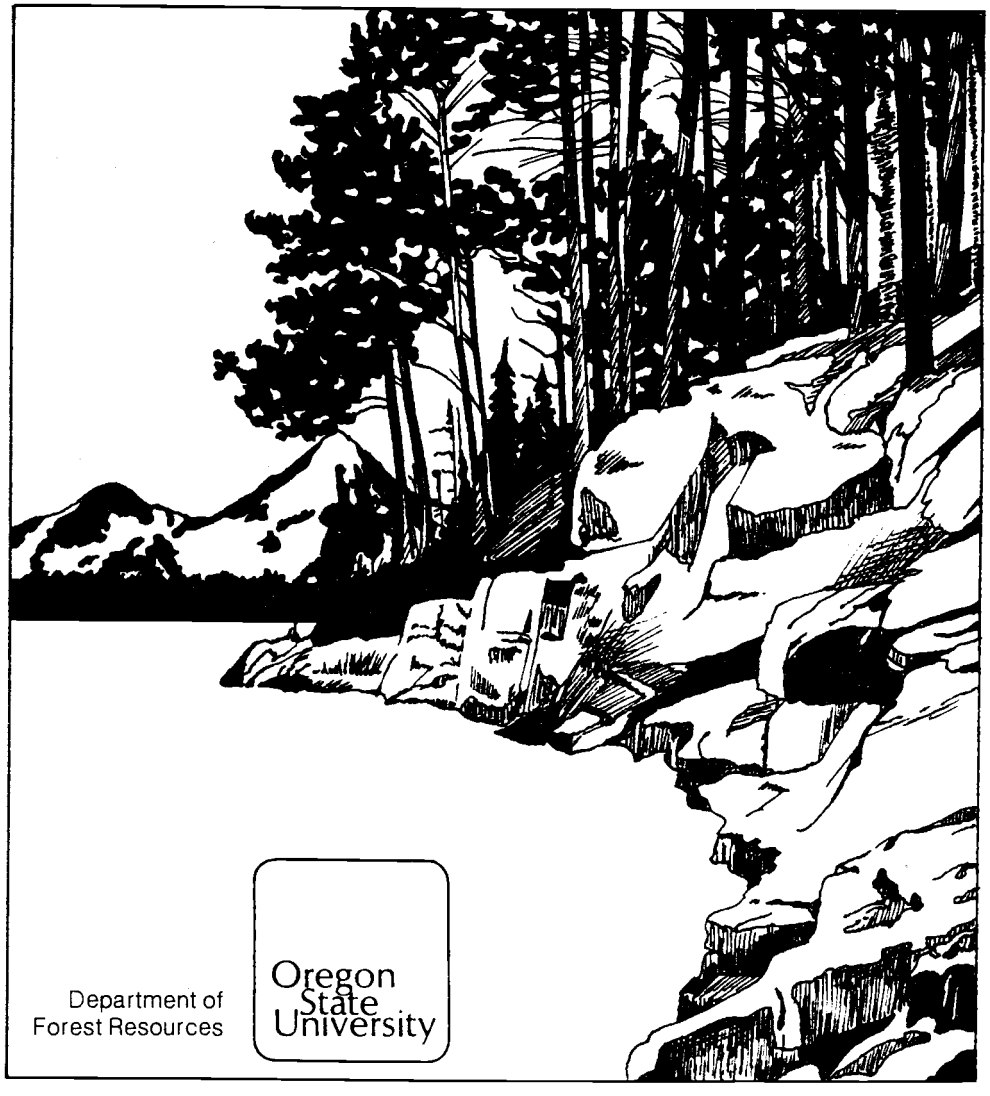
Site 16 Fire Ring

Site 17 Fire Ring

APPENDIX B

SURVEY INSTRUMENT

Evaluating Wilderness Campsite Impacts



Department of
Forest Resources

Oregon
State
University

Oregon State University
Department of
Forest Resources

Evaluating Wilderness Campsite Impacts

In Oregon we have numerous federally designated wilderness areas for public use. Everyone wants them to remain high quality recreation areas, but this requires careful planning. Oregon State University is studying the experiences and preferences of users of wilderness areas and would like you to participate in the survey. This questionnaire is designed to help us learn more about what people value in a wilderness camping experience.

For purposes of this survey "wilderness" means those wilderness areas set aside as unmodified, natural places generally unaffected by the presence of man. Access to these backcountry areas is by cross country trails.

Please try to answer every question, as each response will add to the validity of our survey. There are no right or wrong answers; the best answer is the one which is closest to your own feelings.

The Survey

There are two parts to the survey. In the first part you will be shown a series of slides and asked to respond to each one. Questions in Part II are to be completed by yourself with the help of the directions on each page. Please take time to finish the entire questionnaire as each completed survey is an important part of the research effort.

PART I

In this section you will be shown a series of slides of wilderness campsites. Please evaluate each site using the ratings listed below. Please respond to the specific question asked at the beginning of each section. Be sure to **circle your response** for the corresponding site number.

Question for Sites #1 - 10:
Focus your attention on the amount of bare ground at this site. How acceptable is the amount of bare ground on a scale from 1 = totally acceptable to 5 = totally unacceptable?

Site #1

1 Totally unacceptable
2 Somewhat unacceptable
3 Neutral
4 Somewhat acceptable
5 Totally acceptable

Site #2

1 Totally unacceptable
2 Somewhat unacceptable
3 Neutral
4 Somewhat acceptable
5 Totally acceptable

Site #3

1 Totally unacceptable
2 Somewhat unacceptable
3 Neutral
4 Somewhat acceptable
5 Totally acceptable

Site # 4

1 Totally unacceptable
2 Somewhat unacceptable
3 Neutral
4 Somewhat acceptable
5 Totally acceptable

Site #5

1 Totally unacceptable
2 Somewhat unacceptable
3 Neutral
4 Somewhat acceptable
5 Totally acceptable

Site #6

1 Totally unacceptable
2 Somewhat unacceptable
3 Neutral
4 Somewhat acceptable
5 Totally acceptable

Site #7

1 Totally unacceptable
2 Somewhat unacceptable
3 Neutral
4 Somewhat acceptable
5 Totally acceptable

Site #8

1 Totally unacceptable
2 Somewhat unacceptable
3 Neutral
4 Somewhat acceptable
5 Totally acceptable

Site #9

1 Totally unacceptable
2 Somewhat unacceptable
3 Neutral
4 Somewhat acceptable
5 Totally acceptable

Site #10

1 Totally unacceptable
2 Somewhat unacceptable
3 Neutral
4 Somewhat acceptable
5 Totally acceptable

Question for Sites #11 - 17:

Now focus your attention on the size and appearance of the fire ring at this site. How acceptable is the fire ring on a scale from 1 = totally acceptable to 5 = totally unacceptable?

Site #11

1 Totally unacceptable
2 Somewhat unacceptable
3 Neutral
4 Somewhat acceptable
5 Totally acceptable

Site #12

1 Totally unacceptable
2 Somewhat unacceptable
3 Neutral
4 Somewhat acceptable
5 Totally acceptable

Site #13

1 Totally unacceptable
2 Somewhat unacceptable
3 Neutral
4 Somewhat acceptable
5 Totally acceptable

Site #14

1 Totally unacceptable
2 Somewhat unacceptable
3 Neutral
4 Somewhat acceptable
5 Totally acceptable

Site #15

1 Totally unacceptable
2 Somewhat unacceptable
3 Neutral
4 Somewhat acceptable
5 Totally acceptable

Site #16

1 Totally unacceptable
2 Somewhat unacceptable
3 Neutral
4 Somewhat acceptable
5 Totally acceptable

Site #17

1 Totally unacceptable
2 Somewhat unacceptable
3 Neutral
4 Somewhat acceptable
5 Totally acceptable

Please think back on the series of slides and answer the following:

1. For those sites you classified as "somewhat unacceptable" what does this term mean to you? (check one)

____ The amount of impact is probably too great for a wilderness campsite.
____ The amount of impact is definitely too great for a wilderness campsite.
____ The amount of impact is so great I would not camp here.
____ I did not mark any sites in this category.
____ Other (please explain)_____

_____

2. For those sites you classified as "totally unacceptable", what does this term mean to you? (check one)

____ The amount of impact is probably too great for a wilderness campsite.
____ The amount of impact is definitely too great for a wilderness campsite.
____ The amount of impact is so great I would not camp here.
____ I did not mark any sites in this category
____ Other (please explain)_____

_____

-End of Part I-

PART II

We would like to know how each of the following items add to or detract from your wilderness experience. Please read each statement and use the grading scale on the right to give your opinion. The selection range is from "most strongly detracts from your experience" (-4) to "most strongly adds to your experience" (+4), with choices in between. Please **circle the number** which most closely expresses your feeling for each statement.

		Most Strongly **Detracts** from your experience				Neither Adds nor Detracts				Most Strongly **Adds** to your experience
1.	Being with members of your group	-4	-3	-2	-1	0	+1	+2	+3	+4
2.	Experiencing solitude	-4	-3	-2	-1	0	+1	+2	+3	+4
3.	Litter around campsites	-4	-3	-2	-1	0	+1	+2	+3	+4
4.	Talking with other people in the area	-4	-3	-2	-1	0	+1	+2	+3	+4
5.	Man made fences	-4	-3	-2	-1	0	+1	+2	+3	+4
6.	Shortcuts which cut across trails at switchbacks	-4	-3	-2	-1	0	+1	+2	+3	+4
7.	Evidence of numerous campfires	-4	-3	-2	-1	0	+1	+2	+3	+4
8.	Being by myself	-4	-3	-2	-1	0	+1	+2	+3	+4
9.	Tents visible	-4	-3	-2	-1	0	+1	+2	+3	+4
10.	Signs of improper disposal of human waste	-4	-3	-2	-1	0	+1	+2	+3	+4
11.	Hitching rails at campsites	-4	-3	-2	-1	0	+1	+2	+3	+4
12.	Socializing with other parties	-4	-3	-2	-1	0	+1	+2	+3	+4

		Most Strongly **Detracts** from your experience					Neither Adds nor Detracts			Most Strongly **Adds** to your experience
13.	Large groups (10 or more)	-4	-3	-2	-1	0	+1	+2	+3	+4
14.	Soil erosion around campsites	-4	-3	-2	-1	0	+1	+2	+3	+4
15.	Hikers making shortcuts at switchbacks	-4	-3	-2	-1	0	+1	+2	+3	+4
16.	Hikers and horse riders using the same trail	-4	-3	-2	-1	0	+1	+2	+3	+4
17.	Campsites too close together	-4	-3	-2	-1	0	+1	+2	+3	+4
18.	Horse droppings on the trail	-4	-3	-2	-1	0	+1	+2	+3	+4
19.	Structures such as lean-tos at campsites	-4	-3	-2	-1	0	+1	+2	+3	+4
20.	Other recreationists on trail	-4	-3	-2	-1	0	+1	+2	+3	+4
21.	Seeing others near your campsite	-4	-3	-2	-1	0	+1	+2	+3	+4
22.	Polluted water	-4	-3	-2	-1	0	+1	+2	+3	+4
23.	Horse riders making shortcuts at switchbacks	-4	-3	-2	-1	0	+1	+2	+3	+4
24.	Getting away from crowded situations for awhile	-4	-3	-2	-1	0	+1	+2	+3	+4

In this section we would like to ask some questions about your contacts with other people around your campsite. Please assume that all questions refer to what you feel are acceptable contact levels for a wilderness camping experience.

1. How far should another campsite be from yours? Please specify the minimum acceptable distance. (check one)
   _____ 10-25 feet
   _____ 26-50 feet
   _____ 51-75 feet
   _____ 76-100 feet
   _____ more than 100 feet
   _____ makes no difference

2. When you are at your campsite, how often should you be able to see other parties? (check one)
   _____ Not at all
   _____ Occasional glimpses
   _____ Fairly regularly
   _____ Constantly in sight
   _____ Makes no difference

3. When you are at your campsite, how often should you be able to hear other parties? (check one)
   _____ Not at all
   _____ Occasional sounds
   _____ Fairly regularly
   _____ Constantly hear
   _____ Makes no difference

4. What is the highest number of groups you would tolerate before it would no longer be a wilderness experience? (fill in one number for each statement)
   _____ Maximum number of parties within sight
   _____ Maximum number of parties within sound
   _____ Maximum number of parties within sight and sound
   _____ Maximum number within 25 feet of you

5. If you feel crowded on a wilderness trip, how does it affect you? (check all answers that apply)
   _____ I have never felt crowded in the wilderness.
   _____ I accept the fact of a more crowded experience.
   _____ I try to avoid other campers whenever practical.
   _____ I decide to make future visits at a time when I can expect to see fewer people.
   _____ I decide to go to a more remote area next time.

Wilderness users are attracted to campsites for a variety of reasons. How important are the following factors when you are looking for a campsite in the wilderness? (Circle one number for each item).

		Not Important	Somewhat Important	~~Very~~ Very Important	Very Important
1.	Good distance from the trail	1	2	3	4
2	View of scenery	1	2	3	4
3.	Available firewood	1	2	3	4
4.	Close to drinking/cooking water	1	2	3	4
5.	Water for aesthetic reasons	1	2	3	4
6.	Sheltered from weather	1	2	3	4
7.	Amount of bare ground	1	2	3	4
8.	Size and appearance of fire ring	1	2	3	4
9.	Dry and well drained	1	2	3	4
10.	Flat place for sleeping	1	2	3	4
11.	Close to good fishing	1	2	3	4
12.	Screening from other campsites	1	2	3	4
13.	Out of sight and sound of others	1	2	3	4
14.	No evidence of prior use (litter)	1	2	3	4
15.	Logs and rocks for seating	1	2	3	4

Which of the following Oregon Cascade wilderness areas have you visited in the last five years?

	Area	Approx. of Visits per year
1. Mt. Jefferson	_____	_____
2. Mt. Washington	_____	_____
3. Three Sisters	_____	_____
4. Waldo Lake	_____	_____
5. Diamond Peak	_____	_____
6. Mt. Hood	_____	_____

In this section we would like to ask some questions about your wilderness travel experiences.

1. In general, what kind of trips do you take in? (Check one)
   _____ Day use only
   _____ Overnight camping
   _____ Day use and overnight camping
   _____ Never been to a designated wilderness------>Skip directly to
   question #1 on page 13

2. How many years have you been visiting wilderness areas? (count the years you actually visited the wilderness)
   ____Years

3. During the last five years, how many times each year (average) have you visited the wilderness?
   ____Times per year

4. What is your average length of stay on a wilderness trip?
   _____Day(s)

5. When visiting wilderness areas, what is your usual method of travel? (check one)
   _____ Hiking
   _____ On horseback
   _____ Other (Specify):_____

6. What is the average size of your group in the wilderness?
   _____ Number of people (including yourself)

7. What days of the week do you generally take wilderness trips? (check one)
   _____ Weekends or holidays
   _____ Weekdays
   _____ No particular day

8. When visiting wilderness area, do you generally use a campfire for: (check all that apply)
   _____ Cooking
   _____ Sitting around and visiting with others
   _____ Keeping bugs away
   _____ Don't usually build campfires

9. Do you carry a stove?
   _____ yes
   _____ no

10. Would you build a fire ring at a site where none was present when you arrived?
_____ yes
_____ no

11. When selecting a campsite, do you prefer:
A site with an existing fire ring?
_____ yes
_____ no
A site with previously established area of bare ground?
_____yes
_____ no

12 If you answered "yes" to either of the questions in #11 above, is it because...
For me these features identify a campsite.
_____ yes
_____ no
I prefer a site where these changes have already occurred and my presence creates no additional impact.
_____ yes
_____ no

13. How would you rate wilderness camping as compared to your other recreation activities?
_____ I prefer wilderness camping to any other activity.
_____ Wilderness camping is among my favorite activities.
_____ There are several things I like more than wilderness camping.
_____ There are lots of things I would rather do.

14. During the last five years has your interest in wilderness camping:
_____ Decreased
_____ Remained the same
_____ Increased

15. Other than the group, club or agency now filling out this survey, do you belong to any organization concerned with wilderness issues?

Name of group(s)_____

We would like to get your opinions about wilderness management options. Listed below are various management alternatives which interested users have suggested as possible strategies for ensuring high quality experiences in the wilderness. It is important to point out that many of these policies would apply only to high use areas where impacts are a problem. Please indicate whether you support or oppose them by circling your response.

		Strongly Oppose	Oppose	Neutral	Support	Strongly Support
1.	Limit number of people in group	1	2	3	4	5
2.	Limit number of horses in group	1	2	3	4	5
3.	Close campsites for recovery periods	1	2	3	4	5
4.	Close trailheads for recovery periods	1	2	3	4	5
5.	Limit the use of fires to stoves only	1	2	3	4	5
6.	No camping within 200 ft. of lakes	1	2	3	4	5
7.	No dogs in the wilderness	1	2	3	4	5
8.	Close some areas to horses	1	2	3	4	5
9.	Prohibit camping at high impact lakes within three miles of trailhead	1	2	3	4	5
10.	Require non-fee permit for entry (no permit limit)	1	2	3	4	5
11.	Set limits on number of users for high impact areas	1	2	3	4	5
12.	Provide more information on trailhead and wilderness conditions and use levels	1	2	3	4	5

In conclusion we would like to ask some questions about your background which will help us compare your answers with those of other people. This information will be used in a general way, as in "forty percent of visitors surveyed are 25-30 year old men".
Please be assured that all of your answers are confidential.

1. What is your age?
   _____ Years

2. Are you:
   _____ Male
   _____ Female

3. Marital status:
   _____ Single
   _____ Married

4. Level of education completed?
   _____ High school
   _____ Some college
   _____ Bachelor's degree
   _____ Advanced degree

5. Please check the space that represents your total household income before taxes:
   _____ $0-9,999
   _____ $10,000-19,999
   _____ $20,000-29,999
   _____ $30,000-39,999
   _____ $40,000-49,999
   _____ $50,000-59,999
   _____ $60,000-69,999
   _____ $70,000-79,999
   _____ $80,000-89,999
   _____ over $90,000

6. What size town do you live in?
   _____ Farm or rural area
   _____ Small town (under 5,000)
   _____ Small city (5,000-50,000)
   _____ Large city (over 50,000)
   _____ Suburb of large city

7. Where did you live (mostly) while you were growing up?
   _____ Farm or rural area
   _____ Small town (under 5,000)
   _____ Small city (5,000-50,000)
   _____ Large city (over 50,000)
   _____ Suburb of large city

Your time and effort in completing this survey is greatly appreciated.