AN ABSTRACT OF THE THESIS OF

Liisa I. Kajala for the degree of Master of Science in Forest Resources presented on May 6, 1994.

Title: The Applicability of Conflict Theories In Outdoor Recreation: A Case Study of Hikers and Recreational Stock Users in the Eagle Cap Wilderness

Abstract approved: ____________________________

George H. Stankey

There were two purposes for this thesis. First, it sought to define and clarify key concepts of recreational conflicts based on a literature review on the concept of conflict in the social sciences in general and in outdoor recreation. Second, it tested several hypotheses emerging from the preceding literature review with a case study of conflict between hikers and stock users in the Eagle Cap Wilderness (Oregon). The case study examined the extent to which conflict exists between hikers and recreational stock users and the causes, level, and nature of, as well as management options for, this conflict.

It was found that hikers and stock users differ significantly in regard to demographics, attitudes, and the nature of conflicts with one another, with hikers being significantly more in conflict with stock users than vice versa. The variables hypothesized to explain an individual's conflict with the other user group (i.e., hikers toward stock users and stock users toward hikers) were: (1) support for management actions, (2) tolerance for different activities in the wilderness, (3) different levels of solitude desired when visiting the wilderness, (4) previous wilderness experience, (5) perceived similarity/dissimilarity compared to the other user group, (6) perceived ecological impacts of the other user group, and (7) environmental attitudes and political orientation. Results of multiple regression analysis provided at least partial
support for all of the hypotheses, with importance of solitude being the single most important predictor.

The conflict of hikers toward stock users was of specific interest because it was stronger than that of stock users toward hikers; almost one out of two hikers disliked meeting stock users while only 8% of stock users expressed negative feelings toward hikers. The significant predictors in the model of hikers' conflict with stock users were, in addition to solitude, tolerance for stock users, previous wilderness experience, perceived differences between hikers and stock users, and political orientation. These variables explained 54% of the variation in the conflict variable.

Respondents were also asked what should be done about the conflict they experienced. These responses, combined with the literature review and the research findings on the causes of conflicts, formed the basis for the discussion of management implications. Seven principles of conflict management emerged from the study: (1) fundamental value conflicts are inevitable and irresolvable, while disputes related to a specific situation can be managed or solved; (2) conflicts are not inherently good or bad; (3) conflicts form a continuum ranging from mild difference to physical violence, and each conflict stage warrants different kinds of management actions; (4) managers should use the least stringent action likely to produce the desired outcome (minimum tool rule); (5) understanding the multiple origins (causes) of conflicts can improve recreation planning process both by enabling planners to reduce the likelihood for conflicts in advance and by helping management choose effective conflict management techniques; (6) conflict escalation might be necessary for its effective management; and (7) management of conflicts should be proactive, incorporated in the general recreation management process.
The Applicability of Conflict Theories In Outdoor Recreation: 
A Case Study of Hikers and Recreational Stock Users in the Eagle Cap Wilderness

by

Liisa Kajala

A THESIS
submitted to
Oregon State University

in partial fulfillment of
the requirements for the
degree of
Master of Science

Completed May 6, 1994
Commencement June 1994
APPROVED:

_________________________________________
Professor of Forest Resources in charge of major

_________________________________________
Head of Department of Forest Resources

_________________________________________
Dean of Graduate School

Date thesis is presented May 6, 1994

Typed by Liisa I. Kajala
ACKNOWLEDGEMENTS

The two years that I have been studying at Oregon State University have been a very rewarding educational and cultural experience. I am grateful to several people for their help and support at various stages of this study. First of all, my thanks go to the numerous Eagle Cap Wilderness visitors who did not hesitate to give their time and thoughts to this study. Their remarkable cooperation, together with that of Eagle Cap Wilderness Planner Tom Carlson, made this study possible.

I am very grateful to my major advisor, George Stankey, who contributed to this thesis through his constant support and innovation, and who always promptly found time to read and comment on my text. I also greatly appreciate the support of my other committee members, Perry Brown and Gregg Walker, who were there when I most needed them, particularly during spring 1993 when George was fully occupied with the Forest Ecosystem Management Assessment Team. Thanks also go to professors Fred Ramsey and Rebecca Johnson for their professional advice concerning my statistical questions.

Troy Hall provided significant help in many issues ranging from intellectual discussions to logistics, and I am especially grateful for her help in questionnaire design. Kreg Lindberg deserves special thanks for assistance with "immature" computer software and Sandie Arbogast for her help with graphics. "Erityisen paljon kiitoksia" to my husband who, among other roles, served as a research assistant during the data collection. You believed in my efforts even when I did not, and showed it through your assistance, support and love.

Thank you all so much!
# TABLE OF CONTENTS

1. **INTRODUCTION** .................................................. 1
   Purpose of the Study ............................................ 3
   Organization of the Study ..................................... 4

2. **BACKGROUND AND HYPOTHESES** ............................ 5
   Definition of Conflict .......................................... 5
      Broad Definitions Outside the Field of Recreation ....... 7
      Conflict as Goal Interference ............................... 10
      Conflict and Crowding ...................................... 15
   Definition of Conflict in This Study ......................... 17
   Causes of Recreational Conflict ............................... 19
      Outline of the Model ....................................... 23
      Goals and Standards ...................................... 24
      Values and Beliefs ........................................ 29
      Specialization Level ...................................... 32
      Mode of Experience ....................................... 34
      Resource Specificity ..................................... 35
      Socio-demographic Variables ............................... 36
   Hypotheses Tested .............................................. 37

3. **STUDY DESIGN** .................................................. 39
   Study Area ...................................................... 39
   Sampling Methods ............................................. 40
   Measures of the Concepts .................................... 43
      Degree of Conflict ....................................... 46
   Analysis Procedures .......................................... 48

4. **CHARACTERISTICS OF THE SAMPLE** .......................... 50
   Trip Characteristics .......................................... 50
   Socio-demographic Characteristics .......................... 55
   Political Orientation and Environmental Attitudes ....... 60
   Support for Management Actions ............................... 63
   Importance of Solitude, Perceived Differences between Hikers and Stock Users, Tolerance for Stock Users ........... 66
   Perceived Ecological Impacts ................................ 70
   Degree and Asymmetry of Conflict ............................ 72
   Self-Reported Reasons for Conflict ........................... 79
   Management Actions Suggested by Users ....................... 84
LIST OF FIGURES

CHAPTER 2
Figure 2-1. A mechanism underlying the conflict phenomenon. ................. 22

CHAPTER 3
Figure 3-1. Location of the Eagle Cap Wilderness. ......................... 39

CHAPTER 4
Figure 4-1. Level of education by mode of travel. ......................... 57
Figure 4-2. Total household income before taxes by mode of travel ........ 58
Figure 4-3. Size of the community the respondent currently lives in by mode of travel ................................................................. 59
Figure 4-4. Size of the community the respondent used to live in when growing up by mode of travel ............................................. 60
LIST OF TABLES

CHAPTER 2
Table 2-1. Different possibilities for an interpersonal conflict .................. 13

CHAPTER 3
Table 3-1. The response rate and sample size by different modes of travel. 42

CHAPTER 4
Table 4-1. Method of travel for wilderness visitors ............................... 51
Table 4-2. Groups size by mode of travel ........................................... 53
Table 4-3. Previous wilderness experience categories .......................... 54
Table 4-4. Frequencies of users in previous wilderness experience categories by different modes of travel ........................................... 55
Table 4-5. Age by mode of travel ...................................................... 56
Table 4-6. Political orientation by three modes of travel ....................... 61
Table 4-7. "Environmental attitudes" scale and individual scale variable items by three modes of travel ........................................... 62
Table 4-8. "Support for management actions" scale and individual scale variable items by three modes of travel ........................................... 64
Table 4-9. Responses to the statement "Wilderness areas are primarily for recreational purposes" by three modes of travel .............................. 65
Table 4-10. "Importance of solitude" scale and individual scale variable items by three modes of travel ........................................... 67
Table 4-11. "Perceived differences of hikers and stock users" scale and individual scale variable items by three modes of travel ............................ 68
Table 4-12. "Tolerance for stock users" scale and individual scale variable items by three modes of travel ........................................... 69
Table 4-13. Perceptions of ecological impacts of stock use by three modes of travel ........................................... 71
Table 4-14. Perceptions of ecological impacts of hiking by three modes of travel ........................................... 71
Table 4-15. How visitors feel about meeting hikers in the Eagle Cap Wilderness .. 73
Table 4-16. How visitors feel about meeting stock users in the Eagle Cap Wilderness ........................................... 74
Table 4-17. How visitors feel about meeting other user groups in the Eagle Cap Wilderness ........................................... 74
Table 4-18. How visitors report disturbance from other visitors in the Eagle Cap Wilderness ........................................... 75
Table 4-19. Percentages of users having been bothered by numbers, types, or behavior of stock users ........................................... 76
Table 4-20. Percentages of users having been bothered by numbers, types, or behavior of hikers ........................................... 77
Table 4-21. Correlation of the like/dislike conflict measure toward stock users with the "having been bothered by stock users" conflict measure 78
Table 4-22. Correlation of the like/dislike conflict measure toward hikers with the "having been bothered by hikers" conflict measure .............. 79
Table 4-23. Percentages of different reasons reported by respondents who had been bothered by stock users .................................. 82
Table 4-24. Percentages of different reasons reported by respondents who had been bothered by hikers .................................. 83
Table 4-25. Percentages of different management actions suggested by respondents .......................................................... 85

CHAPTER 5
Table 5-1. F-values for comparisons of full and reduced regression models ........ 88
Table 5-2. Multiple regression models of potential conflict variables for hikers and doing both on their conflict with stock users .............. 89
Table 5-3. Simple correlations between the continuous predictor variables and hikers' and doing boths' conflict with stock users .............. 89
Table 5-4. Multiple regression models of potential conflict variables for stock users and doing both on their conflict with hikers .............. 94
Table 5-5. Simple correlations between the continuous predictor variables and stock users' and doing boths' conflict with hikers .............. 94
1. INTRODUCTION

"Horses should be eliminated from the wilderness. They leave their flies and droppings, put giardia in the water, and generally muck up the trails. Frequently people who pack in are not respectful of the wilderness... Horses and the element they bring have no place in a mountain area as pristine as this." (A hiker's comment on a Forest Service registration card)

"In my opinion, horses should not be allowed in this wilderness area. Their impact is too great—they cannot have minimum impact. They are too big, too heavy, and man is too cavalier with them. We saw huge holes over six feet wide, trees scarred, trails mucked up and trampled too deep—all from horses and it was man who let it happen. The meadow was full of MAXIMUM impact due to livestock (horses) overuse and abuse. We suggest you give serious consideration to a ban on livestock (horses) in this area." (A hiker's comment on a Forest Service registration card)

"Please continue to allow horses into the wilderness areas. We enjoy our trips very much." (A stock user's comment on a Forest Service registration card)

"Please keep open to horses - some can only travel this way." (A stock user's comment on a Forest Service registration card)

"The area was nice and very spectacular, but as a very independent horsewoman I feel horses and pack animals don't get enough credit. Because we are the ones who know this country better than them dang backpackers." (A stock user's comment on a Forest Service registration card)

Managers of the Eagle Cap Wilderness are frequently confronted with these kinds of comments. Such remarks suggest that some degree of conflict exists between stock users and hikers; a finding common to many western wilderness areas (e.g., Snyder, 1966; Stankey, 1973; Absher & Absher, 1979; McClaran, 1989; Moore & McClaran, 1991; Watson et al., 1993). Generally, hikers are the one's to complain about stock use in the wilderness, while stock users seem mostly content with the status quo. This...
asymmetric relationship is consistent with previous studies (e.g., Stankey, 1973; Watson et al., 1993).

Because the Wilderness Act (1964) mandates management of wilderness "for the use and enjoyment of the American people..." and both hiking and traveling with stock are legitimate uses of wilderness areas within the act, it is important to clarify the source and extent of the conflict between hikers and stock users in the Eagle Cap Wilderness and to evaluate the need and options for its management.

When considering appropriate management actions, it is helpful to remember that conflict is not inherently good or bad. It is the way we deal with the conflict that creates negative or positive consequences and that makes conflict productive or destructive (Coser, 1956; Deutsch, 1971). Therefore, in order to manage conflict productively, it is pivotal to understand the reasons that give rise to it (Deutsch, 1969; 1971; 1973).

Conflict management is one of the most important tasks of natural resource managers in general and of recreation managers in particular (Jakes et al., 1990; Schreyer, 1990); conflict is one of the social impact parameters to be considered when creating management plans (Stankey, 1973; Williams & Gill, 1991, p. 4, appendix 2). Moreover, analyzing the types of uses an area can support --without leading to unacceptable levels of conflict-- is necessary before establishing carrying capacities or limits of acceptable change for recreational areas (Shelby & Heberlein, 1986; Schreyer, 1990).

There is a large body of literature on social conflict in human society but the literature on conflict in recreational settings is limited. Articles dealing with recreational conflict written prior to 1980 usually do not define the concept. However, Jacob and Schreyer (1980) provided a general theoretical framework for conflict in outdoor recreation, defining conflict as "goal interference attributed to another's behavior". Subsequent research on recreational conflict has been more explicit, often utilizing Jacob and Schreyer's goal interference theory (e.g., Gramann & Burdge, 1981; Ruddell, 1989; Ruddell & Gramann, 1991; Ivy et al., 1992).
Nevertheless, a lack of agreement over the definition of conflict remains even within the field of recreation (e.g., DePoel et al., n.d.), and the operationalization of recreational conflict is a major task that researchers only recently have begun to examine (Ruddell, 1989). In this study, conflict is defined as

*any antagonistic psychological relation or antagonistic interaction attributed either directly or indirectly to the number and/or behavior and/or appearance of other people.*

This conflict definition is modified from the one suggested by Fink (1968).

**Purpose of the Study**

The purposes of this thesis are twofold. First, it is designed to define and clarify key concepts of recreational conflict based on a literature review of the concept of conflict in the social sciences in general and in outdoor recreation in particular. Second, it tests some of the hypotheses emerging from the preceding literature review with a case study of conflict between hikers and stock users in the Eagle Cap Wilderness area (Oregon). The case study examines the extent to which conflict exists between hikers and recreational stock users and the causes, level, and nature of, as well as management options for, this conflict.

The following research questions will be explored:

1. How has conflict been defined in the recreational as well as broader research context and what kind of definition would be most useful for analyzing conflicts between outdoor recreationists?
2. What causes of conflicts have been suggested and/or found in recreational and broader research contexts, and how could the causes of conflicts be combined into a theoretical model conceptualizing the mechanism underlying the conflict phenomenon?
3. Are the potential conflict groups (hikers and stock users in the Eagle Cap Wilderness) similar or dissimilar with regard to demographics, attitudes, and in the nature of conflicts with one another?
4. What are the reasons for conflicts between hikers and stock users in the Eagle Cap Wilderness?

The potential explanatory variables tested are (from most specific to least specific):

- support for management actions
- tolerance of different activities in the wilderness
- different levels of solitude desired when visiting the wilderness
- previous wilderness experience
- perceived similarity/dissimilarity compared to the other user group
- perceived ecological impacts of the other user group
- environmental attitudes and political orientation

5. What do the users suggest should be done about the situation?

6. What do the findings of the literature review and the case study imply for management?

   It is argued that only by developing an understanding of the reasons for conflicts in outdoor recreation can recreation planners reduce the likelihood for conflicts in advance and manage conflicts constructively.

**Organization of the Study**

Chapter one briefly introduces the research topic and the purpose of the study. The second chapter reviews conflict research more broadly, beginning with definitions of conflict in the social sciences, and comparison of conflict with related concepts. Then, a hypothetical model of causes of conflict is developed based on previous research. This discussion provides a basis for presenting the research hypotheses at the end of the second chapter. Chapter three describes the study design: study area, sampling methods, measures used for the concepts, and analysis procedures. Chapter four describes the characteristics of the sample. This establishes a framework for analyzing the multiple regression model developed to test the hypotheses about the causes of conflicts presented in chapter five. The sixth chapter discusses the management implications of the findings and suggests areas for further research.
Conflict is a normal state of human affairs. In everyday language it is commonly viewed as a negative phenomenon (Tjosvold, 1991), but in the social sciences it has been long recognized that conflict is not inherently good or bad (Coser, 1956; Deutsch, 1971). Among other things, "[conflict] prevents stagnation, it stimulates interest and curiosity, it is the medium through which problems can be aired and solutions arrived at, and it is the root of personal and social change" (Deutsch, 1971, p. 19). Moreover, conflict leads to social differentiation, and thereby "helps to establish group and personal identities [as] external conflict often fosters internal cohesiveness" (Deutsch, 1971, p. 19). The negative consequences of conflicts are more obvious, including mental and physical damage, even war (Keltner, 1990).

Given the recognition that conflicts are not inherently malign or benign, how should we manage conflicts to bring about their productive sides? In attempting to answer this question, it is central to understand the conditions (causes, reasons) that give rise to conflicts (Deutsch, 1971). Accordingly, it is important both to understand (1) what conflict is and (2) why it occurs.

The following literature review addresses these two issues. First, the definition of conflict in the social sciences in general and in the recreation literature in particular will be reviewed. Then, both theoretical and empirical research on potential reasons for conflicts will be reviewed. Because most conflict definitions include some reasons for conflict, these two sections have some overlap. One of the goals of this study was to clarify conflict definition apart from the reasons underlying it.

**Definition of Conflict**

The main problem complicating the comparability of results in conflict research is that although every social science considers conflict an important theoretical issue (McNeil, 1965), scholars disagree about the definition of conflict (Fink, 1968; Brickman, 1974; Wall et al., 1987). In his thorough study of the conflict literature,
Fink (1968) calls for a moratorium on the dispute over the definitions and argues for a general social conflict theory with a broad definition of conflict. The basic arguments for a general theory are that (1) a multidisciplinary approach is required as "...no existing social science discipline, by itself, contains sufficient intellectual resources to achieve an adequate theory of ... conflict" and (2) "...even if [the approach] is multidisciplinary, direct study of any given kind of conflict (e.g., international conflict) cannot, by itself, provide sufficient information on which to build an adequate theory covering that class of phenomena" (Fink, 1968, p. 413). Therefore, the scholars in favor of a general conflict theory claim that narrowing one's approach to a certain type of conflict will lead the researcher to neglect some facts or principles "essential to an adequate understanding of that kind of conflict" (Fink, 1968, p. 413).

There are also some objections to general theory, such as that "crucial elements of each particular kind of conflict are inevitably overlooked by theories of greater generality". If one identifies with an idiographic approach, which holds that "true knowledge is of particulars" (Singer, 1949, see Fink, 1968, p. 414), one sees specific theories (or no theory at all) as a way to achieve greater understanding of conflict. Also, the general paradigms can be seen as either helpful or restricting in guiding research (Fink, 1968; Kuhn, 1970; Babbie, 1986).

Interestingly, the situation has not changed significantly since Fink's article was written. The same problem still remains: general conflict theory has not been developed because every researcher tends to be attached to his/her own discipline. Yet, underlying the heterogeneity in conflict research, there is nowadays general agreement about a typology of conflicts; they are often divided into intrapersonal, interpersonal, intragroup, intergroup, national, and international conflicts. Recreational conflicts occur between people, i.e., at an interpersonal level, and can thereby be classified either as intragroup or intergroup conflicts. Although intragroup conflicts (interpersonal conflicts within a group) are possible in recreational settings -- for example, Todd and Graefe (1989) found intragroup conflict to be more common than intergroup conflicts among river recreationists-- there is likely little managers can
do about them. Therefore, the current study focuses on conflicts between groups (i.e., intergroup conflicts). Furthermore, the empirical part of this study examines intergroup conflicts between recreationists, i.e., between hikers and stock users, although outdoor recreation conflicts can occur between recreationists and managers, recreationists and local residents, and managers and local residents as well (Little & Noe, 1984; Hammitt, 1988; Schreyer, 1990).

In the following, the most common definitions of conflict found in the general conflict literature as well as in the literature on recreation conflict are presented and analyzed. Then, based on the analysis, the definition of conflict utilized in this study is presented.

**Broad Definitions Outside the Field of Recreation**

Fink (1968, p. 456) advocated a general theory of conflict, and defined social conflict so broadly that it would include all other conflict definitions:

[social conflict is] any social situation or process in which two or more social entities are linked by at least one form of antagonistic psychological relation or at least one form of antagonistic interaction.

To further emphasize that his definition includes all the possible instances of conflict, he states:

while antagonism... is the common element in all conflicts, there are a number of different kinds of psychological antagonisms (e.g. incompatible goals, mutually exclusive interests, emotional hostility, factual or value dissensus, traditional enmities, etc.) [causes of conflict] and a number of different kinds of antagonistic interaction (ranging from the most direct, violent, and unregulated struggle to the most subtle, indirect, and highly regulated forms of mutual interference), none of which is necessarily present in all instances of conflict.

Because Fink's definition is so broad that it includes all the other definitions of conflict (both in social sciences in general and in recreational research), it will be taken as a reference point in the following analysis.
As Fink (1968, p. 456) has pointed out, antagonistic interaction can manifest itself in various ways "ranging from the most direct, violent, and unregulated struggle to the most subtle, indirect, and highly regulated forms of mutual interference". Similarly, Boulding (1987) perceives international conflict as a continuum ranging from war to union. Keltner (1990) suggests a similar kind of continuum, but defines conflict more narrowly as an intermediate phase in his "struggle spectrum" which proceeds as follows: (1) mild difference, (2) disagreement, (3) dispute (conflict), (4) campaign, (5) litigation, and (6) fight or war. The struggle spectrum or conflict continuum approach also can be found in the psychological literature where conflict has been defined as anything from "intellectual disagreements to physical violence" (Thomas, 1976, p. 891).

Keltner (1990) has criticized the usefulness of the term conflict, suggesting that it is an ambiguous term because it is used too broadly. He argues that the term conflict should only be used to denote violent disputes, and that the term struggle would more appropriately reflect the continuum described above. Keltner's concern is opposite to Fink's (1968), and it can be argued that the word struggle is at least as ambiguous as conflict. For example, Fink used struggle to denote more violent conflicts. Roget's II The New Thesaurus (1986) defines conflict as "a state of open, prolonged fighting" and "a state of disagreement and disharmony", whereas struggle is defined as "an intense competition" and "the use of energy for doing something". Furthermore, Webster's Encyclopedic Unabridged Dictionary (1989) defines conflict by applying the word struggle: "[conflict is] a battle or struggle, especially a prolonged struggle". Thus, the difference between these two terms is subtle, and the present study will use the more commonly accepted term conflict to denote the continuum idea.

Coser's (1956, p. 8) oft-cited conflict definition also utilized the word struggle; Coser saw conflict as "a struggle over values and claims to scarce status, power and resources in which the aims of the opponents are to neutralize, injure, or eliminate the rivals". Mack and Snyder's (1973) definition has the same components as Coser's. They say that for a conflict to occur there must be "position scarcity" or "resource
sarcity", that conflictual behaviors "destroy, injure, thwart, or otherwise control another party or parties", and that conflict always involves attempts to acquire or exercise power. However, Mack and Snyder's definition is more explicit and restrictive than Coser's as it further states that two or more parties must be present, that interaction is essential for a conflict to exist, and that "a conflict relationship is one in which the parties can gain (relatively) only at each other's expense" (p. 36). These clarifications as well as the issue of scarcity are causes of conflict, and will be further elaborated in the next chapter.

McEnery (1985) emphasizes the values aspect --again, a cause-- of conflicts as he states that "conflict is the interaction of any two or more value systems". This is similar to Fink's (1968) "value dissensus". A good example of a value conflict in recreational settings is the dispute over motorized versus non-motorized use in the Boundary Waters Canoe Area (Lucas, 1964; Gladden, 1984; 1990).

Deutsch's social psychological definition (1973, p. 156) states that "conflict exists whenever incompatible activities occur... An action which is incompatible with another action prevents, obstructs, interferes with, injures, or in some way makes it less likely or less effective". Fink does not define antagonism, but according to Webster's Encyclopedic Unabridged Dictionary (1989) it means "acting in opposition, mutually opposing, hostile, unfriendly". Thus, Fink's (1968, p. 8) "antagonistic psychological relation or... antagonistic interaction" is close to Deutsch's "incompatible activities".

One further clarification of terms is needed before proceeding to the definition of conflict in recreational settings. Deutsch (1969, p. 8; 1971, p. 50) notes that "the terms competition and conflict are often used synonymously or interchangeably". He clarifies the distinction between these two terms because "although competition produces conflict, not all instances of conflict reflect competition as conflict can occur both in a cooperative and competitive context". In the present study, it is argued that in recreation settings, conflict is most often caused by competition over scarce resources although there might be conflict even if the resources were unlimited;
people might still disagree over the appropriate use of the land. Thus, the setting where conflict occurs affects conflict dynamics, and this is part of the reason --in addition to the dispute between idiographic versus nomothetic approaches (see p. 6 of this text; Fink, 1968)-- why scholars have disagreed over the appropriate approach to conflict theory although some recent attempts have been somewhat successful (e.g., Keltner, 1990).

**Conflict as Goal Interference**

The Chinese philosopher Confucius (551?-478?) has stated that "For one who has no objective, nothing is relevant". The conflict definitions in this group are based on the assumption that people's behavior is goal-oriented. There is considerable support for this assumption in the social psychological literature (Brehm, 1966; Proshansky et al., 1970, see Gramann, 1982; Lawler, 1973; Fishbein & Ajzen, 1975) as well as in the recreation and leisure literature (e.g., Driver & Tocher, 1970; Driver & Bassett, 1975; Knopf, 1983).

From a communications perspective, Hocker and Wilmot (1991, p. 18) define conflict as "an expressed struggle between at least two interdependent parties who perceive incompatible goals, scarce resources, and interference from the other party in achieving their goals". Other communications researchers (e.g., Folger & Poole, 1984; Pruitt & Rubin, 1986) have adopted slightly modified versions of Hocker and Wilmot's definition. The argument for a more focused definition --instead of the broad definitions presented above (e.g., Fink, 1968; Deutsch, 1969; 1971; 1973)-- is that it "provides a much clearer focus than definitions that view conflict simply as disagreement, as competition, or as the presence of incompatible interests" (Folger & Poole, 1984, p. 4). On the other hand, Pruitt and Rubin (1986, p. 5) realize that by choosing a narrower definition they deliberately exclude certain topics (e.g., "differences of opinion concerning facts, arguments of interpretation over objective reality, blame for prior failure...") from their discussion of conflict.
The first explicit definition of conflict in the recreation literature was based on the assumption that people's recreation behavior is goal-oriented; Jacob and Schreyer (1980, p. 369) defined conflict in outdoor recreation as "goal interference attributed to another's behavior". Articles written prior to 1980 did not define the conflict concept, while subsequent research has mostly utilized Jacob and Schreyer's goal interference definition (e.g., Gramann & Burdge, 1981; Ruddell & Gramann, 1991; Ivy et al., 1992). Yet, there remains a lack of agreement over the definition of conflict even within the field of recreation (DePoel et al., n.d.; Owens, 1985).

It appears that Jacob and Schreyer's (1980) "goal interference" is very close to Hocker and Wilmot's "perceive[d] incompatible goals... and interference from the other party in achieving their goals". However, there is a subtle difference between these two definitions. Jacob and Schreyer (1980), referring to Deutsch (1971), point out that "goal interference does not necessarily imply goal incompatibility". It might well be that two parties hold concordant goals but disagree as to the means of achieving those goals (Deutsch, 1971; Jacob & Schreyer, 1980). In their discussion of goal incompatibility, Hocker and Wilmot (1991) recognize this possibility, but suggest that when the conflict is over the means of achieving the goals, persons still tend to perceive their goals as different. The other two possibilities when people have goal incompatibility and goal interference are similar in discussions of both definitions: (1) conflicting parties may want (or perceive they want) the same thing but not everybody can achieve it because of scarcity of resources or possibilities, or (2) they have different goals but again resources or possibilities are (or are perceived to be) scarce, therefore interfering with the parties' goals.

Other differences between the two definitions are that (1) Hocker and Wilmot's definition includes more qualifications (perceived scarcity, interdependency) which can be regarded as causes of conflict, while (2) Jacob and Schreyer require that conflict is attributed to the behavior of other people. Jacob and Schreyer emphasize the importance of word "attributed"; according to their definition, conflict exists only if one blames another person for his/her dissatisfaction.
Hocker and Wilmot's (1991) book focuses on interpersonal conflict; the authors argue that an intrapersonal conflict changes into an interpersonal one when there are "joint communicative representations of it" (p. 13). Intrapersonal conflict is a prerequisite for an interpersonal conflict, but it is only through communication that there can be interpersonal conflict. Therefore, this definition requires that both parties are aware of the conflict. In recreational conflict, the environment can sometimes be an important medium of communication because conflict can exist even without another party's or individual's presence, through resource conditions. For instance, Hammitt (1983) notes that crowding can occur without the presence of others, through environmental conditions attributed by observers (recreationists) to excessive use.

Table 2-1 describes some of the possibilities where people can either be in conflict with each other or not, depending on the definition of conflict. People are most aware of conflict in case one; both persons/groups recognize that they are in conflict with each other and that the other party is in conflict with them. In case two, person/group A notices both its conflict with B and B's conflict with A, but B has not yet realized there is a conflict situation. Case three is a situation where both parties realize their own conflict with the other party but do not notice that the other party is in conflict as well. In case four, both parties have recognized that the other party is in conflict with them, but not that they are in conflict themselves. Case five clearly would not be a conflict situation according to Hocker and Wilmot's (1991) definition because only A perceives being in conflict with B, recognizing that the reverse is not the case, and B does not perceive conflict at all. Nevertheless, that case represents the situation of asymmetric or one-sided conflict common in recreation situations (e.g., Lucas, 1964; Shelby, 1980a; Adelman et al., 1982; Watson et al., 1993). Asymmetric conflict is one in which one group has an antagonistic relationship with the other group(s), or one group expresses negative evaluations about the other group(s) to significantly greater extent (Watson et al., 1993).

Before an asymmetric conflict can be solved or managed through communication between the parties, some conflict escalation usually needs to take place, in order to
make the party not recognizing the conflict interested in managing it (Pruitt & Rubin, 1986). Essentially, escalation would mean turning the asymmetric relationship into a two-way conflict by letting the other side learn about the antipathy. In recreation settings, it can be either the recreationists in conflict, managers, or both, who make the other party aware of conflict.

Table 2-1. Different possibilities for an interpersonal conflict.¹

<table>
<thead>
<tr>
<th>Case number</th>
<th>Person or group A</th>
<th>Person or group B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Does A recognize</td>
<td>Does B recognize</td>
</tr>
<tr>
<td></td>
<td>A's conflict with</td>
<td>B's conflict with</td>
</tr>
<tr>
<td></td>
<td>B?</td>
<td>A?</td>
</tr>
<tr>
<td>1</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>2</td>
<td>yes</td>
<td>yes</td>
</tr>
<tr>
<td>3</td>
<td>yes</td>
<td>no</td>
</tr>
<tr>
<td>4</td>
<td>no</td>
<td>yes</td>
</tr>
<tr>
<td>5</td>
<td>yes</td>
<td>no</td>
</tr>
</tbody>
</table>

¹Modified from Hocker and Wilmot 1991.

As mentioned in the beginning of this chapter, the goal interference definition as applied to outdoor recreation assumes that people's recreation is goal-directed. The assumption is parallel to expectancy-value theories (see Lawler, 1973, pp. 44-47 for an overview of expectancy-value theories; Fishbein & Ajzen, 1975), which maintain that a person engages in an action because the person expects it to yield particular outcome(s), and also has roots in the "goal-directed" and "need-satisfaction" models of leisure behavior (Driver & Tocher, 1970; Tinsley & Kass, 1978). Goal interference, on the other hand, derives from (1) discrepancy theory (see Lawler, 1973 for an overview of discrepancy theories; Fishbein & Ajzen, 1975), which states that dissatisfaction is due to the difference between actualized and desired goals, and (2) social interference theory (Brehm, 1966; Proshansky et al., 1970, see Gramann, 1982),
which maintains that conflict results from other people (with their number, behavior, or proximity) preventing a person from achieving a goal.

Support for the paradigm that people's behavior is goal-oriented is found in many recreation studies (e.g., Driver & Bassett 1975; Jackson & Wong 1982), and it has been a conceptual basis not only for conflict research, but also for crowding and satisfaction studies in recreation (e.g., Schreyer & Roggenbuck, 1978; Vaske et al., 1980; Absher & Lee, 1981; Ditton et al., 1983). The empirical research on the goal interference model will be reviewed later in this chapter (pp. 26-27), as it is argued that goals are one --but not the only-- cause of conflict.

Researchers testing the goal interference model of conflict have defined a goal as "any preferred social, psychological or physical outcome of behavior that provides incentives for that behavior" (Gramann and Burdge, 1981, p. 17). This definition has its counterpart in Fink's (1968, p. 8) "antagonistic psychological relations" and "antagonistic interaction", with the distinction that Fink does not attribute people's action to motives, incentives, or goals.

The goal interference model of conflict (Jacob & Schreyer, 1980) has been criticized for being based on a too narrow assumption, i.e., that people recreate to achieve certain goals. For instance, in their study of motorists and bicyclists, DePoel et al. (n.d., p. 7) rejected the goal interference approach because they perceived it as too narrow in assuming that all human behavior is goal-directed. Instead, they chose the broader definition of conflict presented by Deutsch (1971): "at the cognitive level, conflict occurs whenever incompatible activities take place together". This broader definition (like the other broad definitions as well) does not explain why the activities are incompatible, and researchers in favor of goal interference theory would view that as the weakness of the definition. They would argue that the activities are incompatible because (1) people either have different goals that not everybody can achieve (scarcity), (2) they are trying to achieve the goals --that may be similar or different-- in different, incompatible ways, or (3) there are simply too many people
aiming at the same goal (e.g., solitude in wilderness) and therefore not everybody can achieve it.

Within the goal interference model of conflict there has been developed an approach that studies the role of personal norms in conflict perception (e.g., Ruddell & Gramann, 1991). Shelby (1992, lecture notes) defines recreational conflict as "interference with recreation experiences resulting from different and incompatible normative definitions of appropriate conditions or behaviors". In this definition, the recreation experience is taken as the general goal. The present study argues that differing norms are one --but not the only-- reason for conflict; the role of norms in recreational conflicts will be discussed further later in this chapter.

**Conflict and Crowding**

Owens' (1985) definition of social and psychological conflict is based on an environment and behavior perspective outlined by Stokols (1977). Owens (1985, p. 252) refers to his earlier work suggesting that "if recreation itself is a social and psychological experience derived from goal-oriented behaviour then (recreational) conflict is a negative experience occurring when competition for shared resources prevents expected benefits of participation from accruing to an individual or group." He also presents two new propositions:

1) "Conflict is a process of social interaction which is operationalized with the general motivational goal of eliminating environmental instability and restoring perceived equilibrium".

2) "Conflict is a cumulative process of social interaction which once established becomes an enduring psychological state guiding the behaviour of individuals and/or groups".

On the basis of the second proposition, Owens argues that conflict can be clearly distinguished from crowding. According to him, the crucial difference between these two related concepts is that crowding is a more transient social process than conflict which accumulates over time. This is a worthwhile notion. However, one could argue
that the difference is not so clear; even crowding can be a cumulative social process. For instance, even if there are no other people around, one can sense the "over-use" indirectly, via impacted trails and campgrounds. Similarly, one could argue that conflict does not necessarily accumulate: individual's norms of appropriate behavior and/or goals for recreation in a certain area can change over time (rationalization, product shift) so that the person will not experience conflict next time when encountering a similar kind of situation, or an individual might change the recreation area (displacement) (Shelby & Heberlein, 1986). Yet, if these mitigative effects do not occur, conflict is likely to accumulate, which will be taken into account in the model of the causes of conflict.

The relationship between definitions of crowding and conflict warrants further discussion because these two concepts are closely related and often studied under the label of social carrying capacity. At the core of the crowding studies has been the relationship between the numbers of people present in a setting and the perceptions of crowding associated with that given situation. Commonly, the first is referred to as social density and the second, crowding, is taken to mean the subjectively defined negative consequences thereof (Absher & Lee, 1981).

As defined above, crowding would be distinct from Jacob and Schreyer's (1980) definition of conflict as goal interference attributed to other people's behavior. However, many studies on crowding (e.g., Stankey, 1973; Gramann, 1982; West, 1982) have found that the behavior of other people affects people's feelings of crowding more than physical density or actual encounters. Thus, other users' behavior (the only reason for conflict according to Jacob and Schreyer 1980) affects people's perceptions of crowding; encountering conflicting behavior makes an individual more sensitive to numbers of other users as well. Consequently, the concepts of crowding and conflict are intertwined, and the impacts of density and behavior of users on an individual's recreational experience could, just as well, be studied under the title of conflict, if conflict was defined more broadly. The gain in doing so would be twofold. First, it would clarify the concept of crowding (i.e., the part of conflict caused by mere density of users) by distinguishing it from a broader phenomenon,
conflict (that can be attributed not only to other people's behavior as suggested by Jacob and Schreyer, but also to the amount of them). Second, by doing so, a conflict definition in the field of recreation would become more compatible with definitions of conflict in other social sciences. This is the approach that will be taken in defining conflict in this paper.

**Definition of Conflict in This Study**

Because Fink's (1968, p. 456) definition of conflict as "any social situation or process in which two or more social entities are linked by at least one form of antagonistic psychological relation or at least one form of antagonistic interaction" is so broad that it applies to practically any conflict situation, and it does not attempt to explain the reasons for the conflict, it will be utilized as a basis of the conflict definition in this study. However, as discussed earlier, an overly broad definition might cause the researcher to overlook some central elements of any particular kind of conflict. Therefore, Fink's definition will be narrowed somewhat to make it more appropriate for recreation settings. Excluding the other definitions discussed above from the current definition of conflict does not mean they are unimportant. Rather, they were left out to distinguish between the conflict phenomenon and its causes, and will be taken into account as underlying variables, as the reasons for conflict (Figure 2-1).

Based on the preceding analysis, conflict in the present study is defined as

> any antagonistic psychological relation or antagonistic interaction attributed either directly or indirectly to the amount and/or behavior and/or appearance of other people.

In the following, the key components of this definition (underlined) will be addressed and contrasted with other relevant definitions presented above.

As discussed earlier, the term antagonistic is close to the word incompatible used in the definition of Deutsch (1971, p. 7). A point of departure from Deutsch's definition ("Conflict exists whenever incompatible activities occur") is that the present
definition states more explicitly that conflict can be either psychological ("antagonistic psychological relation"), physical ("antagonistic interaction"), or both. Thus, this definition of conflict explicitly recognizes conflict as a continuum that can manifest itself as intellectual disagreement or physical violence or anything in between those two ends.

As Jacob and Schreyer (1980) point out, the source of conflict must be identified before a conflict exists between people or groups of people. If a person blames ignorance or bad luck for the antagonistic feeling, there is no interpersonal or intergroup conflict, but rather an intrapersonal conflict which is not of interest here. Therefore, the word attributed is central to the definition, and the definition utilizes the words "directly or indirectly" to further emphasize that the recreationist does not need to meet other people in order to be in conflict with them. For example, a person can be in conflict with other users because the person attributes resource impacts to them or hears them making noise without seeing them. At the same time, consistent with earlier recreational conflict definitions, this definition does not require the conflict to be two-sided; it suffices that one person or group perceives conflict (Table 2-1, case 5).

The behavior component is close to Jacob and Schreyer's definition, and the amount of people is equivalent to crowding. Appearance is not present in other definitions of recreational conflicts but was added because it is one important factor affecting people's perceptions of each other. This definition is broader than Jacob and Schreyer's as it recognizes crowding as one source of conflict. It also avoids the somewhat abstract distinction between the concepts of conflict and crowding suggested by Owens (1985). The definition is not based on the assumption that people's behavior is necessarily goal-oriented. However, as mentioned earlier in this chapter, there is significant theoretical and practical support for the assumption that people's behavior is goal-oriented in recreation settings (Driver & Tocher 1970; Driver and Knopf, 1976; Knopf, 1983), and therefore goal interference will be included as one underlying reason for conflict (Figure 2-1).
Finally, it should be noted that while interpersonal communication literature defines that conflict can occur only between two *interdependent* parties (Hocker & Wilmot, 1991; Folger & Poole, 1984; Pruitt & Rubin, 1986), the notion of interdependency was excluded from the present definition. Interdependency is not necessary in asymmetric conflicts, what many recreational conflicts are. Both parties are dependent on the resource, but not necessarily on each other, for their recreation experience. However, in order to solve recreational conflicts, the parties may need to communicate with each other, and at that point they need to recognize their interdependency. Otherwise the party which does not perceive interdependency will not perceive a need to manage the conflict (Pruitt & Rubin, 1986).

The definition chosen for the current study gives a firm basis upon which to develop operationalized empirical studies, and it is not too narrow if one considers the causes of conflict as well.

**Causes of Recreational Conflict**

It is important to understand the reasons for conflicts to be able to manage them successfully; if we do not understand what is driving a conflict, finding effective remedies for it is likely to be haphazard. Many of the conflict definitions discussed above contain references to causes of conflict (e.g., scarcity, norms, goals). The conflict definition chosen for this study excluded the causes of conflict in an attempt to clarify the distinction between the experienced conflict and the reasons for it. Now, the discussion returns to the question: What are the major factors causing recreationists to experience conflict, irrespective of whether the manifested conflict (i.e., the conflict being expressed, Deutsch, 1971, p. 53) is attributed to the number of people, their appearance, or their behavior? According to Deutsch (1971), these causes are the underlying conflict of which people often are not aware. Yet, conflicting parties should become aware of the underlying conflict because "manifest conflict often cannot be solved more than temporarily unless the underlying conflict is
dealt with or unless it can be disconnected and separated from the underlying conflict so that it can be treated in isolation" (Deutsch, 1971, p. 53).

Most literature on carrying capacity, crowding, and conflict agrees that goals and/or norms provide a basis for comparing preferred situations to those actually encountered, and view this as the mechanism through which evaluations occur (Graefe et al., 1984; for definitions of goals and norms, see pp. 24-26). Ruddell (1989) suggests that personal and social norms would be the major causes of conflict; a person perceives conflict when conditions exceed the norms this person holds (more or less consciously) for appropriate behavior. In fact, Ruddell (1989) found that norms explained conflict more than the goals people had. His conclusion was that norms are probably more stable psychological constructs than goals, and therefore likely to correlate more strongly with conflict perception. Also, norms are probably more readily determinable, and are thus easier to operationalize than goals.

Although both norms and goals are generally seen as important factors contributing to conflict, they still do not explain why people have different goals and norms. Jacob and Schreyer (1980) suggested four factors --activity style, mode of experience, resource specificity, and lifestyle tolerance-- that might affect why people have conflicting goals and/or norms. Their work was the first --and so far only-- attempt to build a theoretical model of recreational conflicts. It was valuable in bringing research attention to the theory of recreational conflicts, and has triggered more focused research in the field.

The framework presented here combines several studies on (1) general causes of conflict where they seem applicable to recreation situations (Fink, 1968; Deutsch, 1969; 1971; Hocker and Wilmot, 1991) and (2) causes of conflict and crowding in recreational settings (Jacob and Schreyer, 1980; Shelby, 1980b; Shelby & Heberlein, 1984; Absher & Lee, 1981; Gramann, 1982; Graefe et al., 1984; Manning, 1985) and expands upon them (Figure 2-1). The purpose of the proposed model is to provide an updated theoretical framework for recreational conflict before proceeding into developing specific hypotheses. First, a general outline of the model is presented,
after which selected key factors of the model are defined and discussed in light of previous research with the focus being on social factors.

Because the Watson et al. (1993) study of hikers and recreational stock users in three wilderness areas --John Muir Wilderness (CA), Sequoia-Kings Canyon National Park (CA), and Charles C. Deam Wilderness (Indiana)-- so far has been the only attempt to test the effect of all four factors suggested by Jacob and Schreyer (1980), it will be frequently cited in the following. Therefore, a brief introduction to the Watson et al. (1993) study is presented here.

Watson et al. (1993) tested sixteen potential predictors based on Jacob and Schreyer's (1980) propositions. They used three different measures of conflict. First, people were asked whether they enjoyed, disliked, or were neutral toward meeting other visitors on this trip. Second, people were asked to rate, on a 5-point Likert-scale, how desirable or undesirable they perceived meeting other types of groups on any wilderness trip. Third, they were asked "if the behavior of any other group had ever interfered with the quality of a wilderness experience at this particular place" (Watson et al., 1993, p. 5). If the answer to the third question was positive, the respondent was asked to identify the type of group and behavior responsible for the interference.

Watson et al. (1993) tested the potential predictors with discriminant models classifying hikers into "in conflict with stock users" or "not in conflict with stock users" categories. These models were developed separately for each of the three conflict measures described above, and for each of the three areas. It was found that all of the predictors were important with some conflict measures and in some settings, but that no general pattern existed on the importance of these factors across all three conflict measures or all study areas. The predictive power of the models was good; five to thirteen potential predictors classified correctly from 70% to 80% of the hikers.
Figure 2-1. A mechanism underlying the conflict phenomenon.
Outline of the Model

Causes of conflict can be divided into social and resource factors, and social factors further into socio-demographic factors, values, and beliefs about issues relevant to the recreation setting, and factors relating more directly to recreation (specialization level, mode of experience, resource specificity) (Figure 2-1). At the individual level, these factors influence the goals and standards a person has for a specific recreation area. The social background of the users, together with the setting that the resource provides, affects the amount, type, and behavior of visitors in the specific setting, creating the social factors for that area. At the same time, the social factors influence resource conditions as well. Consistent with discrepancy (Lawler, 1973; Fishbein & Ajzen, 1975) and social interference theories (Brehm, 1966; Proshansky et al., 1970, see Gramann, 1982), the model assumes that a person compares the current socio-physical situation to his/her goals and standards for the situation (either consciously or unconsciously). In doing so, the person can perceive the situation as acceptable or unacceptable. The latter occurs when his/her goals are interfered with or the situation is not consistent with personal standards.

In the case of an unacceptable situation, there is a discrepancy between what is and what should be according to the individual. There are three ways the person can deal with such a discrepancy (Michener et al., 1990). First, the person can ignore the discrepancy or attribute it to something else than other people. In that case, there will be no interpersonal or -group conflict. Second, the person might try to modify his/her goals and/or standards (rationalization, product shift) or to find other recreation areas (displacement) to alleviate the discrepancy (Shelby & Johnson, 1988; Shindler, 1993). The modification of goals or standards can lead to a reduction or complete removal of conflict, whereas displacement reduces the conflict by reducing the amount of certain types of visitors in the area. Third, the goals and/or standards might be so strongly held or the place might have few if any substitutes (no realistic options for displacement available) that the person is not willing or able to modify his/her goals.
and/or standards or change the recreation area. In this case, interpersonal or -group conflict occurs.

Although any of these factors can cause conflict in itself, typically, two or more of these factors will be present at one conflict, and will be interrelated. For example, a persons' values and beliefs are likely to affect the kinds of recreational activities in which they participate, their attitudes about wilderness, etc.

The multiple causes of conflicts in recreational settings means the conflict process is dynamic, changing over time (e.g., due to recreation specialization, change in demographics and in technology, and due to new information as well as new attitudes about standards and goals). The attitude changes (e.g., people modifying their goals or standards in recreational settings) can be explained by two competing psychological theories. First, reinforcement theory (Lafrancois, 1972, see Bryan, 1979, p. 49) suggests that people change their attitudes depending on whether they are rewarded or punished for holding them. Second, cognitive dissonance theory (Festinger, 1963) suggests that our perceptions consist of "cognitive elements", and if any of these elements is incompatible with others, dissonance occurs. As dissonance is not a comfortable state of mind, it leads individuals to seek consonance by changing their perception.

**Goals and Standards**

As mentioned earlier, researchers testing the goal interference model of conflict have defined goal as "any preferred social, psychological or physical outcome of behavior that provides incentives for that behavior" (Gramann and Burdge, 1981, p. 17; see also Ivy et al., 1992), the definition adopted in this study. One might wonder, however, what the difference is between the psychological concepts of motives and goals. Webster's Encyclopedic Unabridged Dictionary (1989) combines these two concepts by defining motive as "the goal or object of one's action, an incentive". Stankey and Schreyer (1987, p. 252) illustrate well the confusion in terminology: "research on the topic of motivation has been filled with ambiguity; different terms
have been used to describe the forces initiating human behavior... Needs, motives, experience expectations, recreation experience preferences, and desired psychological outcomes all represent slightly different ways of looking at the purpose that engaging in a given type of recreation is supposed to serve".

What complicates the goal interference approach is that people can hold several goals related to a particular aspect of life (e.g., recreation) simultaneously (Driver & Tocher, 1970; Lawler, 1973; Hendee & Burdge, 1974), and the goals can be hierarchical (Michener et al., 1990). A recreation experience is probably the general goal for every recreationist but it means different things to different people even within a given activity, or to the same individual at different times (Schreyer & Roggenbuck, 1978; Graefe et al., 1981). For example, within the broad goal of recreation experience, a person might emphasize the physical exercise aspect of the experience, with solitude and/or social setting being subordinate to it; yet all these goals are present simultaneously.

There is considerable disagreement about the nature and functions of social and personal norms among sociologists (Rossi & Berk, 1985) as well as in the recreation literature (Vaske, Shelby & Graefe, 1986; Roggenbuck et al., 1991; Shelby & Vaske, 1991b; Noe, 1992). However, most sociologists distinguish three factors common to all norms: (1) there are real or perceived rewards associated with compliance with norms, and sanctions associated with non-compliance, (2) norms specify appropriate behavior in specific situations, and (3) norms are shared by the majority of the social group (Rossi & Berk, 1985; Michener et al., 1990; Roggenbuck et al., 1991). Those norms that an individual does not perceive to be shared by the group are called personal norms (Schwartz, 1977, see Roggenbuck et al., 1991; Vaske, Shelby & Graefe, 1986).

Recognizing the specific meaning of the norms concept in sociology, Roggenbuck et al. (1991) have criticized the use of the concept in recreation literature, where norms have been expanded to include evaluations of acceptable social and resource conditions (e.g., Vaske, 1977; Shelby, 1981; Vaske, Fedler & Graefe, 1986; Whittaker
& Shelby, 1988; Shelby & Shindler, 1990; Shelby & Vaske, 1991a). In order to avoid the confusion related to social and personal norms, the current model does not utilize the norms concept. Instead, the term "personal standards" will be used to denote an individual’s evaluations of the acceptability of social and resource conditions (raising from his/her socialization). This might be a fruitful approach in understanding how standards give rise to conflicts. Conflicts can be fueled by lack of social norms over acceptable behavior, and more broadly, by lack of shared agreement about acceptable social and resource conditions.

It has been proposed that the more specific and/or important goals and/or standards people hold, the more likely they are to find other people interfering with their goals and/or standards (e.g., Jacob & Schreyer, 1980). Earlier studies on the subject (e.g., Driver & Bassett, 1975; Jackson & Wong, 1982) found that conflicting groups had significantly different goals for participation, but these studies did not directly test whether, within the same group, those people who were in conflict with others had different goals from those who were not in conflict.

In terms of studies directly testing the relationship between the importance of goals and standards on the level of conflict, Watson et al. (1993) found the importance of solitude (a goal) to be strongly related to the level of conflict so that the more a hiker values solitude as his/her recreational goal, the more likely he/she is to be in conflict with recreational stock users. Similar results have been reported in crowding studies, i.e., people who value solitude are more sensitive to crowding (e.g., Schreyer & Roggenbuck, 1978; Absher & Lee, 1981; Ditton et al., 1983). On the other hand, Gramann and Burdge's study (1981) only scantily supported the goal interference hypothesis, and Todd and Graefe (1989) found no relationship between goals and conflict among canoeists on the Delaware River. Ruddell (1989; see also Ruddell & Gramann 1991) tested both the importance of goals and personal norms (called personal standards here) on conflict between seashore campers, and found that standards explained conflict perception more than goals. Altogether, goals and norms explained 27 percent of the variance in potential conflict in Ruddell’s (1989) model.
All the other conflict studies mentioned above, except Watson et al. (1993), used Recreation Experience Preference Scales (Driver, 1977) to measure recreation goals. The authors have suggested that one reason for their findings (i.e., weak relationship between goals and conflict) could be that Driver's scales are not specific enough for recreational conflict situations. This reasoning is supported by the Watson et al. (1993) finding of a strong correlation between goals and conflict when using a single, specific measure of solitude.

Jacob and Schreyer (1980, p. 373) suggested that "people with specific expectations are more conflict-prone than those with undefined or very general expectations". As mentioned earlier, experience expectations are similar to goals, and this is how Jacob and Schreyer used the term. However, a distinction between the two concepts can be made: Shelby et al. (1983, p. 4) have suggested that "preferences represent ideals, while expectations are tempered by anticipated realities". Thus, preferences are goals in this study (any preferred social, psychological or physical outcome of behavior that provides incentives for that behavior). Shelby et al. (1983) found that expectations had greater explanatory power than preferences. Moreover, Ivy et al. (1992) found that the canoeists who encountered fewer motorboaters than expected, reported less conflict with motorboaters than those who encountered more than expected. Also, Chambers and Price (1986) found that people without expectations about crowding are those least sensitive to it.

Although there is considerable research on personal standards for acceptable levels of use and acceptable ecological impacts in recreational settings (e.g., Vaske, 1977; Shelby, 1981; Vaske, Fedler & Graefe, 1986; Vaske, Shelby & Graefe, 1986; Shelby et al., 1988; Patterson & Hammitt, 1990; Shelby & Shindler, 1992; Williams et al., 1991), these studies have not explored whether the standards influence people's conflict perceptions. However, some studies (Patterson & Hammitt, 1990; Williams et al., 1991) have tested the influence of standards on crowding perceptions and found support for the hypothesis that recreation encounter standards influence the evaluations of recreational setting conditions.
In addition to Ruddell's (1989, see discussions on p. 20 and p. 26 of the current paper) study on the influence of norms on conflict, the other branch of research testing the influence of recreational standards on conflict has been pursued under the label of "tolerance for different lifestyles" (as reflected by differing recreation styles). Jacob and Schreyer (1980, p. 376) suggested that "unwillingness to share resources with members of other lifestyle groups is an important source of conflict in outdoor recreation and in society at large", and they proposed that "if group differences are evaluated as undesirable [i.e., they do not fit within a person's standards] or a potential threat to recreation goals, conflict results when members of the opposing groups confront one another". They defined tolerance broadly as one's willingness to share resources with people possessing lifestyles different from their own, whereas Ivy et al. (1992) limited tolerance to "one's willingness to share resources with activity groups other than one's own" (p. 349). Tolerance has been operationalized according to the latter, more narrow definition by asking respondents to (1) indicate how they perceive their group (in-group) in general gets along with other groups participating in different activity (out-group) (Ivy et al., 1992; Watson et al., 1993), and (2) state whether some use restrictions should be applied on the out-group (Ivy et al., 1992). Thus far, the operationalization of tolerance does not directly explore tolerance for different lifestyles; it only hints that a person's intolerance for different recreational activities might originate from a perception of different lifestyles.

In an Ivy et al. (1992) study, tolerance and expectations explained 40% of the conflict experienced by canoeists in the Everglades National Park. On the other hand, tolerance explained only 13% of the variance in conflict perceived by motorboaters and expectations were not significant at all, even though conflict was experienced in both user groups. Also, the Watson et al. (1993) study supported the tolerance proposition; less tolerant hikers were more likely to be in conflict with stock users.
**Values and Beliefs**

Deutsch (1969; 1971) suggested that conflicts can rise either from real or perceived differences in beliefs and/or values. Similarly, it has been suggested that many conflicts taking place in recreational settings have little to do with recreation itself; they originate elsewhere in the society and recreation areas just provide one setting for conflicts to occur (Jacob, 1977; Jacob & Schreyer, 1980; Stankey & Schreyer, 1987). The mechanism suggested here is that differences in generic values and beliefs affect an individual's goals and standards for the specific recreation situation—either directly or through specialization level, mode of experience, or resource specificity discussed below—thereby fueling conflicts in recreation settings. Thus, tolerance for different recreational activities, discussed above, can partly rise from perceived or real differences in values and beliefs.

The definitions of values, attitudes and beliefs vary in the social psychological literature. Generally, values are seen as the most primitive, fundamental constructs representing a general ideological disposition, which influences more specific attitudes (favorable or unfavorable evaluations of a specific issue or object, Shaw & Wright, 1967). Thus, values are so generic that they can be measured only through attitudes (de Vaus, 1990). Beliefs represent the information a person has about a certain issue or object (Fishbein & Ajzen, 1975; Michener et al., 1990). Facts do not speak for themselves. They are interpreted through an activated frame or schemata and are influenced by values the person holds; as a result of this interpretation process, beliefs are formed. Especially in cases where no well-established, generally agreed-upon facts exist, the influence of values becomes more pronounced. Thus, "it is our underlying values, to a large degree, which determine what facts will count as important" (List, 1993, see Steel et al., 1994). For example, a person who values the natural environment very high is more likely to believe that people have greater impacts on it than a person who does not place a high value on the natural environment. Personal standards, as defined in this study, are specific attitudes about
how things should be, what kind of resource and social conditions are acceptable vs. unacceptable in the wilderness.

Value conflicts commonly have been suggested as the source of conflict between motorized and non-motorized recreation (Knopp & Tyger, 1973; Devall & Harry, 1981; Jackson & Wong, 1982; Gladden 1984; 1990; Pedersen, in press) but the hypothesis has not been tested with stock users and hikers. Bury et al. (1983, p. 402) suggested that the more the recreational activities differ on their dependence on technology and dominance over the environment, the more conflict-prone they are. Perhaps the clearest example of a conflict raising from fundamental value differences has been reported in the Boundary Waters Canoe Area (BWCA). The on-going conflict between canoeists and motorboaters has been documented by several authors and over many years (Lucas, 1964; Adelman et al., 1982; Gladden, 1984; 1990). Gladden (1990) attributed the conflict most directly to fundamental ideological differences with canoeists being more nature preservation oriented (biocentric) than motorboaters, who were more anthropocentric. Gladden found that visitors who used motors were more willing to accept extractive resource uses such as logging and mining, whereas, visitors travelling with nonmotorized means had much stricter definitions of appropriate land uses in wilderness. He stated "[t]he BWCA case is an example of a struggle between divergent social values over the role of technology in natural areas" (p. 63).

Because anthropocentric and biocentric world views often are seen as colliding value systems causing environmental conflicts, and because the role of these value systems in recreational conflict will be tested in the present study, these concepts warrant definition. An anthropocentric orientation is a "human centered orientation toward the non-human world" (Eckersley, 1992, see Steel et al. 1994, p. 5); it gives a central position to "humans, human needs, and human satisfactions" (Steel et al., 1994, p. 5). A biocentric orientation, on the other hand, "values the non-human world for its own sake rather than for only the sake of its utility to humans" although "it
does not deny that human desires and values are important" (Steel et al., 1994, p. 7).

Steel et al. (1994, p. 9) note that

while these value orientations are not mutually exclusive (except perhaps in their most extreme forms) and are multi-dimensional, we believe that they can be arrayed on a continuum with the most anthropocentric orientation on one end and the most biocentric orientation on the other... Most of the public probably falls somewhere between these two ends and are not purely anthropocentric or purely biocentric in their orientations.

Conflicts stemming from fundamental value differences are regarded as hard to manage. Crowfoot and Wondolleck (1990) state that natural resource conflicts, which are based on fundamental value differences, cannot be solved; they are an important part of on-going societal change and should not even be regarded as something to be ended. Instead, they suggest that particular disputes (i.e., situation specific, manifested conflicts) can be settled. Applied to recreational conflict situations, this would mean that conflicts between recreationists in a specific area can be managed for the satisfaction of both sides although the fundamental value differences that give rise to these conflicts cannot be reconciled. For example, the conflict in the BWCA suggests that the value differences between the two political coalitions are unresolvable.

Related to perceived differences in values and beliefs, the research on social psychological attraction theories (Newcomb, 1956; 1961; Gergen, 1974, see Adelman et al., 1982) has found that in general, persons who perceive themselves as similar are more likely to like each other than persons who perceive themselves as different. Of course, these differences can be attributed to factors other than values and beliefs (e.g., recreation goals, socio-economic status) as well.

Adelman et al. (1982) applied social psychological attraction theory to explain the conflict between canoeists and motorboaters in the Boundary Waters Canoe Area. Their research supported the theory; canoeists perceived themselves very different from motorboaters and were strongly in conflict with them, whereas the motorboaters perceived canoeists as quite similar to motorboaters and were much less in conflict
with canoeists. Watson et al. (1993) also found that hikers who perceived themselves different from stock users in regard to lifestyle, socio-economic status, education level, reasons for visiting wilderness, etc. were more likely to be in conflict with them.

**Specialization Level**

Jacob and Schreyer (1980, p. 371) proposed that "the more intense [specialized] the activity style, the greater the likelihood a social interaction with less intense participants will result in conflict", as the goals and standards become more specific and important in the process of specialization. In his study of recreation specialization among trout fishermen, Bryan (1977, 1979) notes that the more specialized an activity becomes, the more specialized goals and standards of appropriate social and resource conditions it tends to have. Furthermore, specialization usually increases the value of the activity to the participant. An activity can even become a central interest of life, valued higher than work.

Research on this hypothesis can divided into two parts: (1) recreation specialization, which affects what kinds of goals and standards people hold, and (2) studies directly testing the relationship between the level of specialization and the level of conflict.

Literature on specialization has found some support for the first proposition, i.e., that recreation specialization affects what kinds of goals and standards people hold. Schreyer et al. (1984) observed significant correlation between previous experience (or, as they call it: experience use history, EUH) of river recreationists and differences in their behaviors, motives for participation, subjective perceptions of the environment and the trip, and support for managerial intervention. On the other hand, Wellman et al. (1982) did not find support for the hypothesis that more specialized canoeists would be less likely to accept depreciative behavior. However, the authors attribute the results to their methodology and conclude that the issue warrants further research.
The Schreyer et al. (1984) study also appears to support the second proposition, i.e., that specialization level influences the level of conflict; more specialized users were more likely to perceive conflicts between users on the study river. However, it should be noted that their conflict question was a general one ("in general, do you think there are conflicts between river users?"), instead of asking people if they had personally experienced conflict. It is logical that the generic conflict question correlates strongly with previous experience; people who have visited the area more often are more likely to have encountered conflicts between users even if they personally have not been involved in one. Therefore, the Watson et al. (1993) study, in which they tested the relationship between respondent's past wilderness experience and his/her personal conflict experience, is a more rigorous test of the present hypothesis. Previous wilderness experience was not very significant in their study; it was retained as a predictor in their regression model only when the behavior-based measure of conflict was used, and even then it was among the least powerful explanatory variables.

Watson et al. (1993) tested the proposition about the impact of recreation specialization on conflict also by asking several questions about users' perceptions of the skills required for hiking and horseback riding, assuming that would reflect perceived level of specialization. These perceptions neither scored very high as an explanatory variable nor were they completely uncorrelated.

Another possible measure of the intensity of an activity, not yet tested in relation to recreational conflicts, might be perception of the amount of time and money invested in the activity (Virden & Schreyer, 1988). However, that might reflect status associated with the activity, also suggested by Jacob and Schreyer (1980) as a potential contributor to conflict. Again, the mechanism is that different recreational goals and norms of appropriate status evolve with recreation specialization. Conflict related to status hierarchies can occur "between different status hierarchies, within the same status hierarchy, and between participants who pursue or reject status as a
recreational goal" (Jacob & Schreyer, 1980, p. 372). Moreover, "status hierarchies in recreation are often based on equipment and expertise possessed" (p. 372).

Watson et al. (1993) tested the proposition above with a scale variable labelled "activity associated status". It turned out to significantly explain conflict in all the models. They state that "[hikers in conflict with stock users] are not as likely to accord high status to horse users" (p. 32). This is a case of different status hierarchies causing conflict, but studies on the possible other dimensions of status hierarchies have not been pursued.

**Mode of Experience**

The recreational experience of a person in an unfocused mode consists of "environmental generalities, overall spatial relationships, the lay of the land but not its particulars" (Jacob & Schreyer, 1980, p. 375), whereas the recreational experience of a person in a focused mode is dependent on specific qualities of the environment. Therefore, recreationists in an unfocused mode tend to oppose use restrictions that they perceive only as restrictions on one's sense of freedom. On the other hand, recreationists in a focused mode tend to support use restrictions if they perceive them as a way of protecting the quality of the area at the level necessary to meet their goals and standards.

Mode of experience and recreation specialization are closely related concepts; more specialized recreationists tend to be more focused in their mode of experience. However, the concepts are discussed separately here, to be consistent with previous research. Watson et al. (1993) maintained the same category (mode of experience) but renamed it as "focus of trip".

Jacob and Schreyer (1980, p. 375) suggested that "when a person in the focused mode interacts with a person in the unfocused mode, conflict results. Furthermore, the greater the gap between two recreationists along the unfocused-focused continuum, the greater the potential for conflict". The conflict mechanism in this hypothesis is that the more focused one's trip is, the more specific and sensitive one's goals and
standards are, and the more likely it is that conflict will occur (Figure 2-1). Focus of a
trip can be on activities, settings, or companions (Williams, 1988). Watson et al.
(1993) utilized these categories (activities, physical settings, and social settings) when
analyzing conflict between hikers and recreational stock users. Focus on activities and
focus on social settings remained as explanatory variables in some conflict models,
while focus on physical settings was an unimportant predictor.

Watson et al. (1993) also studied "desired place characteristics" under the focus of
trip, although it is closely related to specialization; previous experience and
specialization affect preferences and expectations (Vaske et al., 1980). For instance,
Virden and Schreyer (1988) found that recreation specialization can serve as an
indicator of environmental preference. Furthermore, Watson et al. (1993)
operationalized the desired place characteristics scale so that it, in fact, measured
standards of what the specific wilderness should be like. It was only slightly
significant as a predictor, although one scale item ("This wilderness should be a place
with no horses allowed") scored high as a distinct explanatory variable.

Resource Specificity

"Resource specificity" can be defined as "the importance an individual attaches to
the use of a particular recreation resource" (Jacob & Schreyer, 1980, p. 373). If a
person values the resource highly, that person is more likely to get irritated by
inappropriate behavior of others, too many people, or people's appearance because
s/he holds more specific goals and standards for the place (Figure 2-1).

Watson et al. (1993) expanded this factor to include some concepts not explicitly
suggested by Jacob and Schreyer (definition of place in solitude terms and definition
of place in regulation terms), and thereby labelled it "definition of place". Watson et
al. (1993) tested this hypothesis with five summative scale variables (i.e., place
identity, place dependence, place attachment, definition of place in solitude terms, and
definition of place in regulation terms) and, with one variable derived by factor
analysis, describing place-specific past experience. All but the "place-specific past
experience" variable appeared to be important explanatory variables in some models, but none of them were consistently significant across all the models. It remains unclear how they operationalized place identity, place dependence, and place attachment in their study.

The Schreyer et al. (1984) study on river recreationists, presented earlier in recreation specialization discussion, implicitly supports the resource specificity hypothesis as well. In their study of the influence of past experience on river recreationists' behavior, they found that locals and veterans (i.e., people who have done at least five trips on the study river) were more likely to experience conflict between users. Schreyer et al. (1984) conclude the findings could have been due to locals and veterans having a stronger sense of possessiveness toward the river resource.

Williams et al. (1992) found several visitor characteristics (e.g., previous wilderness experience, focus on setting as opposed to activity or group, and rural residence) to increase visitors' attachment to specific wilderness areas.

**Socio-demographic Variables**

Socio-demographic variables such as age, social group, and place of residency are antecedent variables affecting the likelihood of conflict via one or more other social factors. Most of the literature on conflict and crowding does not mention the possible effect of socio-demographic factors on recreationists' perceptions of crowding or conflict; socio-demographic variables are regarded as control variables not worth mentioning if they are not significant. Usually it appears that if variables related more closely to the phenomenon studied are controlled for, the demographics are rendered insignificant. For example, Gramann and Burdge (1984) found that older people reported less crowding than younger ones. They suggest that "seniors as a group are more gregarious and tolerant of large congregations of people than younger visitors" (p. 182). Thus, had the psychological construct of tolerance been controlled for, age probably would not have come out significant in a multiple regression model. On the
other hand, if one takes a more inclusive path analysis approach, socio-demographic variables are likely to remain significant antecedent variables. For example, Absher and Lee (1981) found that the level of backcountry camping experience correlated with age, and keeping age as an antecedent variable increased the explanatory power of their crowding model.

The research addressing rural-urban differences on leisure orientations and conflict has not found the place of residence to be a significant explanatory variable. For example, Watson and Niccolucci (1992) found only a weak relationship when testing the effect of the place of residence on hikers' conflict with horse-back riders. Similarly, place of residence has not been found to be significant in explaining preference for solitude—-one of the goals potentially increasing likelihood of conflict—-in leisure settings (Spencer et al., 1992). On the other hand, rural residents were found to be more attached to their recreational settings than their urban counterparts (Williams et al., 1992).

**Hypotheses Tested**

The hypotheses were formed based on the model described in the preceding discussion. Due to the complex nature of conflict, not all of the hypotheses emerging from the model could be tested. Instead, two kinds of hypotheses were chosen: (1) hypotheses that had received consistent support from earlier studies, and (2) those that had not been tested yet. This kind of approach provided a way of testing new hypotheses while controlling for variables that had been found significant in other studies, and which therefore should be included in the model. The presentation of the hypotheses is organized from most specific to most general, i.e., it proceeds from standards and goals toward hypotheses regarding general lifestyle and value differences. For each hypothesis below, except H₁, the general category is identified (in italics), utilizing the terminology in Figure 2-1. Although the purpose of the case study is to analyze conflicts between two modes of travel (hikers and stock users), the specific groups are not repeated in every hypothesis unless necessary for clarity.
H₁: There is an asymmetric conflict situation where hikers dislike stock users significantly more than vice versa.

H₂: Personal standards: The more a person thinks human impacts on wilderness are unacceptable and should be minimized, the more likely s/he is to be in conflict with other users.

H₃: Personal standards: A person who is less tolerant of different wilderness activities and lifestyles is more likely to be in conflict with other users in the wilderness.

H₄: Goals: The more a person values solitude as a goal of the recreation experience, the more likely that person is to be in conflict with other users.

H₅: Specialization level: The more experienced the user is, the more specific idea s/he has of what is an acceptable wilderness experience, and the more likely s/he is to perceive other users detracting from this experience.

H₆: Beliefs: The more a person perceives (believes) hikers and stock users are different from one another, the more likely s/he is to be in conflict with the out-group.

H₇: Beliefs: A person in conflict with other users perceives other users to have higher ecological impacts on the wilderness than a person not in conflict with other users.

H₈: Values: The more biocentric view of the world a person has and the more liberal the person is, the more likely s/he is to be in a conflict with other users, feeling that other users are reducing the quality of the wilderness resource.
3. STUDY DESIGN

Study Area

The Eagle Cap Wilderness, located in the Wallowa-Whitman National Forest in northeastern Oregon, is one of the original wilderness areas established by the 1964 Wilderness Act. Initially, the wilderness was 216,250 acres, but additions have increased its current size to 358,461 acres. It is about a 6 hour drive from Portland, 3 hours from Boise (Idaho), and 4 hours from Spokane (Washington) (Figure 3-1). Elevation within the area ranges from 5,000 feet to almost 10,000 feet. The area consists of glaciated and densely forested valleys, alpine lakes and meadows as well as granite ridges and peaks. Approximately 33,400 people visited the Eagle Cap Wilderness between June 20 and November 30, 1993 (Hall & Shelby, 1994). Compared to the only other available figures, use has significantly increased from years 1978-1980 when it was estimated to be about 20,000 people (Bombaci, 1980). At the same time, it seems that there has been a shift to day use so that the actual amount of overnight use has decreased somewhat (Hall & Shelby, 1994).

Figure 3-1. Location of the Eagle Cap Wilderness.
Sampling Methods

There are 34 trailheads in the Eagle Cap Wilderness (Appendix A). Because of limited resources and great distances between trailheads, not every trailhead could be sampled. The relative level of use each trailhead receives was unknown when the sampling was implemented because past use data were not available. Thus, the sampling frame was designed based on rough estimates of use provided by Forest Service employees. However, the on-site surveying and registration system produced use figures for season 1993, making it possible afterwards to estimate the adequacy of the sample.

The data collection for the study took place during the main use season (July-September 1993), and was implemented in two ways. First, for the 10 trailheads that were estimated to be most heavily used (Appendix A), a trailhead survey was done; i.e., visitors were asked to fill out an 8-page questionnaire on-site (Appendix C) at the trailhead. Second, for the remaining 17 trailheads that were estimated to receive little use but which had Forest Service registration boxes at them, a mail survey was implemented based on names and addresses visitors provided on the registration cards. In the following, only the trailhead survey sampling method is described because the mail survey was not used in data analysis. The reasons for omitting the mail survey from the analysis were (1) very low registration rates (ranging from 9% for day stock users to 63% for overnight backpackers) and (2) the fact that the mail survey yielded only information on one person per group whereas the on-site trailhead survey yielded information on all group members. In other studies it has been found that recreationists party leaders often differ significantly from other party members, and that party leaders who register are significantly different from non-registrants (Jubenville, 1971; Lucas & Oltman, 1971). It was recognized that a high response rate does not solve the problem of an unrepresentative sample. The decision not to use the low-use trailhead sample was made possible by the success of the on-site survey described below.
The main concerns when designing a sampling frame for any dispersed recreation setting are obtaining an adequate and representative sample over time at a reasonable cost. In order to ensure an adequate sample, the ten trailheads estimated to be most heavily used were chosen for the on-site survey, and each of these trailheads was sampled twice on a weekday, once on Saturday and once on Sunday (most of the use occurs on weekends). To meet the requirement of representativeness over time, each trailhead had at least one sampling day each month and Saturday and Sunday sampling days were in different months. To further ensure a sufficient population in each stratum, half of the trailheads were sampled five times instead of the above-described four. Because of time and budget constraints (two interviewers and one car), the sampling was done in time blocks of nine days each month, and two adjacent trailheads were sampled the same day (Appendix B). Every sampling day, the researchers arrived at trailheads by 9:00 am and stayed at least until 6:00 pm.

Every visitor 16 years of age or older exiting the wilderness on the chosen sampling days was asked to fill out an 8-page questionnaire on-site. If the visitor refused to fill it out, s/he was asked if s/he would be willing to do it later on and return it in a postage-paid envelope. In case the person was willing to take the questionnaire home, s/he was asked to fill out a one-page survey containing questions on demographics, trip characteristics, and his/her name and address. If the person refused to participate even in the mailing option, s/he was asked to answer the same demographic and trip questions as those who took the questionnaire home for mailing, with the exception of their name and address. This was done to assess non-respondent bias. For the same reason, the interviewers observed and coded information about all the people coming out from the trailhead they were sampling: gender, mode of travel, day vs. an overnight visitor, group size, and which persons belonged to the same group. Asking the name and address from people who took the questionnaire home for mailing made it possible to send them a replacement questionnaire together with a post-paid envelope and a cover letter if they had not returned the questionnaire after three weeks.
The above-described sampling arrangement yielded a total amount of 45 sampling days and a response rate of 87.4% with a sample of 602 hikers, 178 persons traveling with stock and 5 individuals traveling with llamas on this trip (Table 3-1).

Table 3-1. The response rate and sample size by different modes of travel.

<table>
<thead>
<tr>
<th></th>
<th>hikers</th>
<th>stock users</th>
<th>llama users</th>
</tr>
</thead>
<tbody>
<tr>
<td>contacted</td>
<td>677</td>
<td>214</td>
<td>7</td>
</tr>
<tr>
<td>filled out the 8-page survey on-site</td>
<td>76%</td>
<td>70%</td>
<td>28%</td>
</tr>
<tr>
<td>n=515</td>
<td>n=149</td>
<td>n=2</td>
<td></td>
</tr>
<tr>
<td>returned a completed survey in mail without a reminder</td>
<td>8%</td>
<td>9%</td>
<td>43%</td>
</tr>
<tr>
<td>n=55</td>
<td>n=19</td>
<td>n=3</td>
<td></td>
</tr>
<tr>
<td>returned a completed survey in mail after a reminder</td>
<td>5%</td>
<td>5%</td>
<td>0%</td>
</tr>
<tr>
<td>n=32</td>
<td>n=10</td>
<td>n=0</td>
<td></td>
</tr>
<tr>
<td>overall response rate and number of surveys returned</td>
<td>89%</td>
<td>83%</td>
<td>71%</td>
</tr>
<tr>
<td>n=602</td>
<td>n=178</td>
<td>n=5</td>
<td></td>
</tr>
</tbody>
</table>

The non-respondents consisted of those who refused to fill out the 8-page questionnaire at the first place (4%), and of those who failed to return the questionnaire via mail (9%). The comparison of non-respondents with respondents across seven variables that were measured from both groups revealed no statistically significant differences in age, gender, or between day and overnight users. On the other hand, there were statistically significant differences in group size, mode of travel, and level of education between the two groups. The respondents traveled in bigger groups than non-respondents, with an average group size being 4.4 adults and 0.9 children for respondents as compared with 3.3 adults and 0.5 children for non-respondents (t=2.29, p=0.023 for number of adults, t=2.46, p=0.010 for number of children, two-tailed t-test). There were relatively more stock user non-respondents...
than respondents (33% vs. 23%, Pearson’s chi-square=4.9, p=0.027). Respondents were more educated than non-respondents; the median class for respondents was "Bachelor's or equivalent" and for non-respondents "some college" (Kruskal-Wallis one-way analysis of variance p=0.0005). Thus, the sample has slight overrepresentation of bigger groups, hikers, and higher educated people. However, these differences would seem unlikely to affect the study's conclusions, given an overall response rate of 87%. Furthermore, the demographic and trip characteristics may or may not correlate with the attitudes studied (Jubenville, 1971; Lucas & Oltman, 1971), and therefore the usefulness of this comparison in estimating the impact of non-respondents on results is limited.

The ten trailheads that were included in the on-site survey accounted for 80% of the use of the wilderness (Hall & Shelby, 1994). As in most wildernesses, use was highly concentrated at a few trailheads (Roggenbuck & Lucas, 1987; Shelby & Hall, 1992); three northeastern side trailheads (Wallowa Lake, Two Pan and Hurricane Creek) accounted for 60% of all the use. Also, the way each of the 10 trailheads was sampled secures a lot of variance in the sample (Appendix B) especially as it was discovered after the season was over that the "high-use" trailheads encompass some trailheads that get less use than some of the ones in the mail survey sample for the "low-use" trailheads (Hall & Shelby, 1994).

**Measures of the Concepts**

Some commonly used demographic measures were included in the survey to allow for comparison to other studies, to test for non-respondent bias, and to control for them in the prediction model. All the attitude and perception measures were based on Likert-scales, which were treated as interval type variables in scale development and further analysis. The assumption that Likert-scales are interval type variables means that intervals between scale points are assumed to be equal. There is no theoretical justification for making this assumption but from a practical standpoint the justification is twofold. First, research testing the impact of this assumption has found
no significant differences in results achieved by treating Likert-scales as interval type vs. ordinal type variables (e.g., Labovitz, 1967; Borgatta, 1968; Schroeder, 1984). Therefore, various authors have suggested that treating Likert-scales as interval variables is justified from a practical point of view; it allows (1) the use of simple means that are easier to interpret and faster to calculate than scale scores calculated for ordinal type variables by fairly complex formulas (Schroeder, 1984) and (2) the use of parametric tests, which tend to be more rigorous than their non-parametric counterparts (Labovitz, 1967; Borgatta, 1968). Especially, a scale formed by summing several Likert-type responses together tends to yield more nearly equal interval scores than each individual scale alone (Nunnally, 1967), and even when this is not the case, such summative scales generate a larger number of categories and thereby less distortion (O'Brien, 1981a; 1981b). Second, probably due to the first reason, it has become conventional to treat Likert scales as interval type variables in attitude research (e.g., Hammitt & Madden, 1989; Spencer et al., 1992; Watson et al., 1993; Steel et al., 1994).

A scale consists of items that measure a common underlying construct, also called a latent variable. Therefore, in order to verify that certain items form a scale, the scale needs to be tested for its reliability and unidimensionality. Ideally, the scales should be pre-tested with a representative sample of the population to which the final survey is to be administered (DeVellis, 1991, pp. 77-80). In most wilderness settings, where the use season is short, one season is required for pretesting and another for administering the refined survey. Because of this practical limitation, the pretest population of this study was not a representative sample of the Eagle Cap Wilderness visitors. Instead, it consisted of visitors to Mount Jefferson Wilderness and of participants to two Eagle Cap Wilderness public meetings (arranged by the Forest Service in April 1993). The pretesting helped in testing the applicability of the trailhead sampling method and in finding out possible wording problems in the questionnaire, but did not allow for rigorous testing of the scales.
Most of the environmental attitude scale had been tested for its reliability in an earlier study (Steel et al., 1994), but the rest of the scales were tested for their reliability and unidimensionality only in the present study. Because the prediction model was developed separately for three different types of visitors classified by their mode of travel, the scale testing was done separately for each of these groups.

A reliable scale is one which is likely to produce consistent results every time it is administered (de Vaus, 1990, p. 54). In the present study, reliability for each scale was calculated using Cronbach's alpha which is a good general measure of reliability in case of multiple-item measures (DeVellis, 1991). Any potential item problems (noncentral mean, poor variability, negative correlations among items, low item-scale correlations, and weak inter-item correlations) tend to reduce alpha of the scale (DeVellis, 1991, pp. 82-83). De Vaus (1990) suggests that a scale is reliable if alpha is at least 0.7 and DeVellis (1991, p. 85) considers an alpha of 0.65-0.7 to be "minimally acceptable", 0.7-0.8 to be "respectable", and an alpha of 0.8-0.9 to be "very good". Before calculating Cronbach's alpha, all the items for a particular scale had to be recoded so that higher scores reflected consistently the same direction of the underlying attitude (described in DeVellis, 1991, pp. 80-82).

In a unidimensional scale, "each item measures the same underlying concept" (de Vaus, 1990, p. 239). Unidimensionality of the scales was tested in two ways. First, each item's correlation with the rest of the items in the scale was analyzed. De Vaus (1990) suggests that if any item-total correlation is less than 0.3, the item should be dropped from the scale. Only once (in the case of "support for management actions" scale) one item-total correlation was lower than 0.3. This item was dropped from the scale and included separately in the regression model. Second, principal factor analysis, which requires no distributional assumptions (Dillon & Goldstein, 1984), was used to further test the unidimensionality of the scales. If all the items loaded on the same factor, the scale was judged to be unidimensional. This was the case for all the scales.
There were two reasons why factor analysis could not be used in the common way to confirm which items belonged to each scale. First, including all the scale questions into one factor analysis excluded almost half of the population because many respondents had at least one "no opinion". Second, some scale items that did not belong together conceptually correlated strongly with one another and thus loaded on the same factor. It is important to use both existing theory and one's own judgement in determining if items that empirically belong together also do so conceptually (DeVellis, 1991, p. 107). Therefore, although this kind of factor analysis was performed, and it mostly supported the existing scales, its results are not reported here.

After having ensured that particular items form a scale, the scale scores were calculated. For each individual, scores on all the scale items were summed (Mueller, 1986, p. 13) and divided by the total number of items in the scale. In order to retain enough respondents in the prediction model, the missing values (caused by either a person not answering a question or stating that s/he had no opinion about it), were replaced with the average scale score for that person. This was done only if a person had no more than two missing answers per 9-item scale (environmental attitudes), and no more than one missing answer per scales having six items or less. This method is recommended by de Vaus (1990) if one has to replace missing values.

**Degree of Conflict**

Conflict was operationalized with two questions in the questionnaire. First, visitors were asked on a 7-point Likert-type scale to indicate their feelings about meeting other types of groups (from "dislike meeting them a lot" to "enjoy meeting them a lot", with an option of "never met this type of group", question #11 in the questionnaire, Appendix C). Each mode of travel was divided into day and overnight users and stock users into those riding horses or mules and those leading horses or mules. This yielded two items for the scale measuring visitors' feelings about meeting hikers and four items for the scale measuring their feelings about meeting stock users.
Similar kinds of measures have been commonly used in recreation research (e.g., Lucas, 1964; Adelman et al., 1982; Watson et al., 1993). The second set of questions asked visitors to state whether they had ever been bothered by (1) the number of, (2) particular types of, or (3) the behavior of hikers or stock users when visiting the Eagle Cap Wilderness. The answer options were "not at all", "very little", "somewhat", and "a lot". Furthermore, if people had been bothered, they were asked in an open-ended format to specify what it was that had bothered them (questions #13 and #14 in the questionnaire, Appendix C). This second set of conflict questions was exploratory; it has not been used before as a measure of conflict in recreation research. However, Watson et al. (1993) used a similar measure when asking whether "the behavior of any other group had ever interfered with the quality of a wilderness experience at this particular place".

**Predictors for Conflict**

With the exception of a measure of previous wilderness experience and political orientation, other potential conflict predictors were measured on a 5-point Likert-type scale. Five measures (environmental attitudes, support for management actions, importance of solitude, perceived differences between hikers and stock users, and tolerance for stock users) had five response categories ranging from strongly disagree to strongly agree. A "no opinion" alternative was also provided. For perceived ecological impacts of hikers and stock users, the response categories ranged from "no impact at all" to "serious impacts" with 5 response categories and an "I don't know" option. Previous wilderness experience was a composite categorical measure based on three questions following the logic of Schreyer et al. (1984). Political orientation was measured with one question having seven Likert-type response categories. Individual items forming each of the scales are presented in the next chapter together with an explanation of the sources of the scales, their rationale, and the results (Tables 4-6 through 4-14).
Analysis Procedures

Although the sample obtained by trail-head contacts is not a random probability sample, an attempt was made to make it as close to one as possible in a dispersed recreation setting. Therefore, it was assumed that statistical inference, which is based on the assumption of a random probability sample (de Vaus, 1990), can be utilized. Before beginning the data analysis, it was tested that there were no significant differences in any of the key variables between the trailheads that had been sampled four times and those that had been sampled five times. This made it possible to combine all the trailhead questionnaire answers into one data set.

Two main types of analyses were conducted. First, all relevant variables were analyzed across the potential conflict groups to see how similar or different these groups were in terms of their trip characteristics, socio-demographics, and selected attitudes about wilderness and environment as well as attitudes and perceptions of conflict. Where applicable, these results are compared with findings from other studies. This analysis includes comparisons of both individual questions and attitude scale scores where applicable. Because the three groups to be compared had different sample sizes, analysis of variance for unbalanced designs (SAS, 1989) was used to compare interval type variables' overall differences. A two-tailed t-test was chosen for pairwise comparisons of the means of interval type variables because it controls for comparisonwise error rate which was of interest in this case (SAS, 1989). For nominal and ordinal type variables, frequency tables using Pearson's chi-square measure of association were used in testing the statistical significance of the differences. For reasons of clarity, all the percentages reported in the frequency tables were rounded to the nearest whole number.

The analysis of variance has two underlying assumptions (normal distribution of the means and homogeneity of variance) and the t-test has one (normal distribution of the means). In this case, based on central limit theory, the large sample sizes ensured that the sample means were normally distributed (Ranta et al., 1991). As analysis of variance is a somewhat robust method and usually becomes unreliable only when both
underlying assumptions are violated, the results should be fairly reliable even if the homogeneity of variance requirement was not met in all the comparisons (Ranta et al., 1991). To confirm this, some comparisons were done both with parametric tests and their non-parametric equivalents (Kruskal-Wallis one-way analysis of variance for overall differences and Mann-Whitney U-test for pairwise comparisons of means), and the levels of significance remained the same.

Second, the potential predictive scale variables were combined into a linear multiple regression model. The reason for choosing to report multiple regression results instead of statistical methods holding less strong assumptions about the nature of the data was that although the preliminary non-parametric tests gave similar kinds of results, they would not have been as powerful tests of the hypotheses. At the same time, it should be noted that as this study was non-experimental, regression analysis could not be used to establish causal relationships, and therefore the cause-effect reasoning was based on theory. The regression model was analyzed for its underlying assumptions, i.e. linearity, independency of explanatory variables, and heteroskedasticity by using scattergrams and suitable statistical indexes.
4. CHARACTERISTICS OF THE SAMPLE

In this discussion, the data play two roles: (1) they describe the population thereby allowing for comparisons of the present study to other studies where applicable; and (2) they provide background for understanding the role of these variables in explaining conflict. The presentation begins with a description of trip and socio-demographic characteristics, proceeds into describing attitudes and perceptions of the population as measured in the survey, and ends with the analysis of conflict situation.

Trip Characteristics

Two measures were used to describe the mode of travel. First, the interviewers coded how people traveled on this specific trip. Second, people were asked to indicate all the ways in which they had traveled in the past in the Eagle Cap Wilderness (question #6 in the questionnaire, Appendix C). Table 4-1 illustrates the current use pattern using both measures. Nearly one-fourth of the sample were stock users, a figure consistent with what the Forest Service found in their study implemented at the same time (Hall & Shelby, 1994). There seems to be no clear trend toward increasing or decreasing stock use. In the 1960s, 30% of the Eagle Cap Wilderness visitors traveled with stock (Hendee et al., 1968) whereas during 1978-1980 the relative amount of stock use had dropped below the current ratio, to 20% (Bombaci, 1980). However, the figures from the past are likely to be underestimates because the previous studies were based on registration cards and, according to many studies (e.g., Lucas, 1983; Petersen, 1985), stock users are less likely to register. In any case, the relative amount of stock use in the Eagle Cap Wilderness still remains much higher than in western Oregon wildernesses (Mount Jefferson, Mount Washington, and Three Sisters), where stock use amounts to less than 10% of total use (Shelby & Hall, 1992). On the other hand, it is lower than in the John Muir (32%) and Charles C. Deam Wildernesses (33%) but somewhat higher than in the Sequoia-Kings Canyon Wilderness (21%, Watson et al., 1993).
Table 4-1. Method of travel for wilderness visitors (N=785).

<table>
<thead>
<tr>
<th>Method of Travel</th>
<th>On this trip</th>
<th>In general</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hiking</td>
<td>77% (n=602)</td>
<td>66% (n=517)</td>
</tr>
<tr>
<td>Using stock</td>
<td>23% (n=178)</td>
<td>17% (n=130)</td>
</tr>
<tr>
<td>Traveling both with stock and hiking</td>
<td>Not applicable</td>
<td>16% (n=124)</td>
</tr>
<tr>
<td>Using llamas</td>
<td>1% (n=5)</td>
<td>2% (n=14)</td>
</tr>
</tbody>
</table>

For the purposes of the prediction model, users were classified according to the second measure, i.e., how they previously had traveled in the Eagle Cap Wilderness. This measure was chosen as the basis for classification because it reflects each user's mode of travel in general and is thereby a more comprehensive measure of mode of travel than the one which described how users had traveled on the trip they had just finished. A comprehensive measure was more meaningful in this case because the attitude and perception measures were not specific for this trip, either. As can be seen from table 4-1, three main modes of travel emerged: (1) people who had done only hiking (will be referred to as "hikers"), (2) people who had both hiked and used stock (horses, mules), either for riding or for carrying equipment (will be referred to as "doing both"), and (3) people who had only used stock to travel (will be referred to as "stock users"). Because the visitors classified by three main travel modes appeared quite different in their trip characteristics, socio-demographics, and attitudes, the following analysis addresses those differences where they exist. Outfitters (N=5) and those people who had at least once travelled with llamas in the Eagle Cap Wilderness (N=14) were excluded from the further analyses to focus on the three main user groups. The total sample size after this modification is 766 (517 hikers, 125 stock users, and 124 respondents who have done both).
Based on interviewers' observations, over half (57%) of the visitors surveyed had just finished a day trip with the remaining 43% of the visitors having finished an overnight trip. This is consistent with findings of Hall & Shelby (1994) and indicates a remarkable shift toward day use over the past decade as Bombaci (1980) reported 25-34% being day use years 1978-1980. There were no significant differences across modes of travel between day and overnight trips. However, male visitors did more overnight trips than female visitors with two thirds of females doing day trips (Pearson's chi-square=9.19, p=0.002).

Respondents were asked how long they usually stayed on their visits to the Eagle Cap Wilderness (question #2 in the questionnaire, Appendix C). However, answers to this question appeared unreliable, and were therefore not used in further analyses. For example, a little over half of those people who had just finished their first trip to the Eagle Cap and who, based on observations by the interviewers had been on a day trip, reported that they usually stay in the Eagle Cap Wilderness overnight. This might reflect that the wilderness boundary was unclear to these people and that they included trailhead campgrounds (sometimes fairly developed) in their definition of wilderness. Thus, it was concluded that the question did not measure what it had been thought to measure; if some differences did exist based on this question, it would be hard to interpret what those differences really meant.

Based on observations, the average group size was 4.4 adults and 0.9 children and there were no significant differences between modes of travel. This is somewhat higher than in other recent wilderness studies but falls within the range of group sizes of 1970s and 1980s (Roggenbuck & Lucas, 1987). For example, in the Mount Jefferson, Mount Washington, and Three Sisters Wildernesses average group size was 2.8, including children (Shelby & Hall, 1992). On the other hand, based on the survey question asking the group size in general (question #3 in the questionnaire, Appendix C), significant differences did emerge between the three modes of travel with hikers

\[ n=143, \text{ these people were asked to answer the survey question on the basis of this trip only} \]
traveling in smaller groups (Table 4-2). This is consistent with findings from the John Muir, Sequoia-Kings Canyon and Charles C. Deam Wildernesses, where the average group sizes of hikers were significantly lower as compared to stock users (3.7 vs. 5.0, 2.8 vs. 4.4, and 2.6 vs. 3.6, respectively) (Watson et al., 1993).

Table 4-2. Groups size by mode of travel.

<table>
<thead>
<tr>
<th>Group size</th>
<th>hikers (%)</th>
<th>doing both (%)</th>
<th>stock users (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-2 people</td>
<td>41</td>
<td>31</td>
<td>18</td>
</tr>
<tr>
<td>3-6 people</td>
<td>44</td>
<td>59</td>
<td>66</td>
</tr>
<tr>
<td>&gt;6 people</td>
<td>15</td>
<td>10</td>
<td>17</td>
</tr>
</tbody>
</table>

Previous wilderness experience was measured with three questions (questions #1, 8, and 9 in the questionnaire, Appendix C). About one-third (35%) of the Eagle Cap visitors were on their first visit. In this sense, the Eagle Cap Wilderness is a typical wilderness (Roggenbuck & Lucas, 1987). The median number of visits was 3 times, including this trip, and the mean 9.6 visits. In 1960s the average number of trips taken to the Eagle Cap was much lower, 5.2 (Hendee et al., 1968), which might reflect a shift toward more but shorter trips, or that the clientele is older and has therefore a longer use experience. The three modes of travel were significantly different from one another with hikers having visited the Eagle Cap Wilderness least (mean=5.6) and those both hiking and traveling with stock most (mean=22.2) (one-way anova for unbalanced designs F=85.8, p=0.0001, all groups different from one another at p=0.05, two-tailed t-test).

The extensive experience of visitors in the Eagle Cap was matched by their experience visiting other wildernesses as well; typically, visitors had been to at least eight designated wildernesses in the U.S. Hikers and those doing both had been to
more wildernesses than stock users (one-way anova for unbalanced designs $F=14.4$, $p=0.0001$, stock users different from hikers and those doing both at $p=0.05$, two-tailed t test).

Most of the respondents (59%) visit wildernesses between once and five times a year and there were no clear differences between different modes of travel. Frequencies are in the Appendix C (question #9). Due to different response categories, the results are not directly comparable to previous wilderness studies but seem to be roughly consistent with them; according to Roggenbuck and Lucas (1987) visitors averaged 3 to 4 wilderness visits per year.

For the purposes of the prediction model, respondents were classified into four categories based on two measures of previous wilderness use, i.e., number of visits to the Eagle Cap Wilderness and number of designated wildernesses visited in the U.S. (Table 4-3).

<table>
<thead>
<tr>
<th>Table 4-3. Previous wilderness experience categories.</th>
</tr>
</thead>
<tbody>
<tr>
<td>number of visits to the Eagle Cap Wilderness:</td>
</tr>
<tr>
<td>less than 10</td>
</tr>
<tr>
<td>number of designated wildernesses visited in the U.S.</td>
</tr>
<tr>
<td>5 or more</td>
</tr>
</tbody>
</table>

To be consistent with previous research, the labeling system follows the logic of Schreyer et al. (1984) developed for river recreationists. The meanings of the labels should be interpreted in light of their operationalization. For example, although "locals" are more likely to be from an area closer to the Eagle Cap than "collectors", this is not necessarily the case for every "local". Also, "beginners" can be from the local area but they just have not been visiting wildernesses as much as "locals". It should also be noted that the classification yields a nominal type variable; locals and
collectors have a different kind of wilderness experience but it is not possible to say which group has more experience.

Based on the above-described three measures of wilderness experience, it can be concluded that although recreationists using all the modes of travel visit wildernesses with about same frequency, there is a significant difference in the orientation of these three groups. Stock users and those doing both seem to be more specialized into using the Eagle Cap Wilderness, whereas hikers visit a wider variety of wildernesses (Table 4-4).

Table 4-4. Frequencies of users in previous wilderness experience categories by different modes of travel.¹

<table>
<thead>
<tr>
<th></th>
<th>beginners (%)</th>
<th>collectors (%)</th>
<th>locals (%)</th>
<th>veterans (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>hikers</td>
<td>31</td>
<td>52</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>doing both</td>
<td>20</td>
<td>19</td>
<td>27</td>
<td>35</td>
</tr>
<tr>
<td>stock users</td>
<td>39</td>
<td>18</td>
<td>25</td>
<td>18</td>
</tr>
</tbody>
</table>

¹Pearson's chi-square=152.4, p=0.0001.

Socio-demographic Characteristics

The average age of all adult (16 years or older) visitors was 39 years; hikers were significantly younger than stock users or those doing both (Table 4-5). Furthermore, the overnight hikers' average age was 32 years, which was significantly less than the average age of day hikers, 41 years (two-tailed t-test p=0.0000). Both trends were present in the nine western wilderness areas studied by Lucas (1980), and backpackers have been found to be younger than day hikers also outside wilderness settings (Bammel & Bammel, 1982). In the case of stock users or those visitors both using stock and hiking, there were no significant differences in the average age between day and overnight users. This suggests that age does not limit overnight trip possibilities.
when a person has a stock animal to carry the gear (and himself/herself). More generally, the higher average age of stock users and doing both --especially as compared to overnight backpackers-- supports the argument that stock has an important role in enabling older people to enjoy the wilderness. A 66-year-old stock user commented in the survey:

Most young backpackers want to eliminate horses and mules. They want only backpackers to be able to visit the area. This would eliminate most older people. These young people forget that they too will get old.

Table 4-5. Age by mode of travel.¹

<table>
<thead>
<tr>
<th></th>
<th>hikers</th>
<th>doing both</th>
<th>stock users</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean age</td>
<td>37</td>
<td>41</td>
<td>43</td>
</tr>
<tr>
<td>standard deviation</td>
<td>14</td>
<td>11</td>
<td>13</td>
</tr>
<tr>
<td>n</td>
<td>516</td>
<td>124</td>
<td>124</td>
</tr>
</tbody>
</table>

¹F=12.0, p=0.0001 (one-way anova for unbalanced designs), all the means different at p=0.05 (two-tailed t-test).

Overall, there were somewhat more male (59%) than female (41%) visitors. In other wilderness studies, the gender imbalance has been higher; typically 70% to 85% have been male visitors (Roggenbuck & Lucas, 1987). For example, in the 1960s, 82% of the Eagle Cap Wilderness visitors were males (Hendee et al., 1968). It is problematic as to whether this reflects a real change or is due to different sampling methods. Earlier studies were often based on group leaders, who have been found to overrepresent male visitors (Jubenville, 1971), whereas in the present study everybody from the group was asked to participate and non-respondents did not differ from respondents in terms of gender. There were no significant differences in gender between the three modes of travel (Pearson's chi-square=5.76, p=0.056).

There were significant differences across all modes of travel with regard to visitors' level of education. Median educational level for hikers was "Bachelor's or
equivalent" whereas the median for stock users and those doing both was "some college" (Figure 4-1). The difference in education levels of hikers and stock users is consistent with some other studies (Lucas, 1980; 1985) although more recently Watson et al. (1993) failed to find such differences between hikers and stock users in two Sierra Nevada (CA) wildernesses.

![Figure 4-1](image)

Figure 4-1. Level of education by mode of travel. Test for differences between modes of travel: Pearson's chi-square=50.5, p=0.000, N=757. Level of education: 1=elementary school, 2=some high school, 3=high school graduate, 4=some college, 5=Bachelor's or equivalent, 6=Master's or equivalent, and 7=advanced degree (Ph.D., M.D., etc.).

When comparing the three modes of travel in terms of income level, the differences were not as clear as with education (Figure 4-2). The incomes of hikers were slightly lower than of those using stock or doing both. This difference can be due to the fact that education levels in this study do not correlate very strongly with
incomes (e.g., many hikers holding graduate degrees might still be students, a factor affecting income level but not asked in the questionnaire), or due to hikers being on the average younger than stock users. Lucas (1980) suggested that stock users might have lower incomes than hikers, but this is not supported by either the current study or by recent work by Watson et al. (1993).

![Graph showing total household income before taxes by mode of travel. Test for differences between modes of travel: Pearson's chi-square=19.6, p=0.033, N=704. Income class: 1=less than $25,000, 2=$25,000-$39,999, 3=$40,000-$54,999, 4=$55,000-$69,999, 5=$70,000-$84,999, and 6=over $85,000.]

Legend
- **hikers, n=474**
- **doing both, n=120**
- **stock users, n=110**

Figure 4-2. Total household income before taxes by mode of travel. Test for differences between modes of travel: Pearson's chi-square=19.6, p=0.033, N=704. Income class: 1=less than $25,000, 2=$25,000-$39,999, 3=$40,000-$54,999, 4=$55,000-$69,999, 5=$70,000-$84,999, and 6=over $85,000.

Most stock users had grown up in smaller communities than hikers and the same holds true for the size of the community in which they currently live (Figures 4-3 and 4-4). This is consistent with previous studies (Lucas, 1980; 1985; Watson et al., 1993). As with so many other measures, those doing both were between hikers and stock users in regard to the size of the community.
An explanation for this finding might lie in socialization processes. Rural residence appears to favor stock use; it is easier and less expensive to keep horses or mules in the countryside than in a city. Thus, rural upbringing helps create more opportunities for experience with stock in wilderness. Once a person has been socialized into this kind of wilderness recreation, the mode of travel is likely to remain throughout the individuals' life, irrespective of where they live, presuming the opportunities remain, i.e., the person either continues to live in the rural area or keeps in touch with people living there.

![Graph showing size of the current community by mode of travel. Test for differences between modes of travel: Pearson's chi-square=94.4, p=0.000, N=764. Size of community: 1=farm or rural area, 2=small town (under 1,000 population), 3=town (1,000-5,000 population), 4=small city (5,000-50,000 population), 5=medium city (50,000-1 million population), and 6=major city or metropolitan area (over 1 million people).]
Figure 4-4. Size of the community the respondent used to live in when growing up by mode of travel. Test for differences between modes of travel: Pearson's chi-square=65.4, p=0.000, N=761. Size of community: 1=farm or rural area, 2=small town (under 1,000 population), 3=town (1,000-5,000 population), 4=small city (5,000-50,000 population), 5=medium city (50,000-1 million population), and 6=major city or metropolitan area (over 1 million people).

**Political Orientation and Environmental Attitudes**

Political orientation and environmental attitudes were measured in order to test the hypothesis that "conflicts may originate elsewhere in the society at large and recreation areas only furnish the stage for acting out these conflicts" (Jacob, 1977; H8, p. 38). Environmental opinions have been found to correlate fairly strongly with political orientation so that conservative people tend to be less environmentalistic (Steel et al., 1994). This was true of this study as well (Pearson's correlation coefficient= -0.58, p=0.0001).
An individual's political orientation (Table 4-6) was measured with one question (question #25 in the questionnaire, Appendix C) similar to that used by Steel et al. (1994). Hikers were significantly more liberal than stock users or those doing both. Moreover, hikers were more liberal and stock users and doing both slightly more conservative than Americans or Oregonians in general; both of the latter groups rate at 4.2 on the Steel et al. (1994) political orientation scale.

Table 4-6. Political orientation by three modes of travel.¹

<table>
<thead>
<tr>
<th></th>
<th>hikers</th>
<th>doing both</th>
<th>stock users</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean</td>
<td>3.6A</td>
<td>4.5B</td>
<td>4.5B</td>
</tr>
<tr>
<td>standard deviation</td>
<td>1.5</td>
<td>1.4</td>
<td>1.3</td>
</tr>
<tr>
<td>n</td>
<td>507</td>
<td>120</td>
<td>123</td>
</tr>
</tbody>
</table>

¹Measured with a 7-point Likert-scale ranging from 1=very liberal to 7=very conservative, with 4 being moderate. F=28.8, p<0.0001 (one-way anova for unbalanced designs). Superscript letters indicate significant differences (at 0.05 level, two-tailed t-test) between groups.

The environmental attitude scale (Table 4-7) was a combination of scales developed by Steel et al. (1994), Dunlap and Scarce (1991), and Noe and Hammitt (1992). Persons scoring low on this scale can be described as anthropocentric (human centered) and persons scoring high on this scale as biocentric (nature centered) (Steel et al., 1994). The anthropocentric view argues that nature has value only for humans, whereas the biocentric view argues that nature has value for itself (so called "intrinsic" or "inherent" value).

The three groups were significantly different from one another in terms of their environmental attitudes, with hikers holding the most biocentric, and stock users, the most anthropocentric view of nature (Table 4-7). However, the differences were more subtle than with some other attitudes measured. To recall the hypothesis, it was suggested that people holding more biocentric and liberal views would be more in
conflict with other users, as they would be more likely to be concerned by other people degrading the wilderness resource. As hikers were more in conflict with stock users than vice versa, the hypothesis is supported by this analysis, although more rigorous testing of this hypothesis was performed with the regression model.

Table 4-7. "Environmental attitudes" scale and individual scale variable items by three modes of travel.

<table>
<thead>
<tr>
<th></th>
<th>Hikers mean (s.d.)</th>
<th>Doing both mean (s.d.)</th>
<th>Stock users mean (s.d.)</th>
<th>F-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>More wilderness areas should be established in the U.S.</td>
<td>4.15^A (1.05)</td>
<td>3.31^B (1.46)</td>
<td>3.07^B (1.42)</td>
<td>53.6***</td>
</tr>
<tr>
<td>Humans must live in harmony with nature in order to survive.</td>
<td>4.51^A (0.72)</td>
<td>4.16^B (0.91)</td>
<td>4.10^B (0.80)</td>
<td>21.3***</td>
</tr>
<tr>
<td>The earth should have far fewer people on it.</td>
<td>3.55^A (1.21)</td>
<td>3.49^A (1.26)</td>
<td>3.37^A (1.24)</td>
<td>1.0</td>
</tr>
<tr>
<td>Wildlife, plants, and humans have equal rights to live and develop on the earth.</td>
<td>3.64^A (1.26)</td>
<td>3.28^B (1.34)</td>
<td>3.08^B (1.33)</td>
<td>11.0***</td>
</tr>
<tr>
<td>The balance of nature is very delicate and easily upset.</td>
<td>4.05^A (1.05)</td>
<td>3.49^B (1.19)</td>
<td>3.38^B (1.22)</td>
<td>25.7***</td>
</tr>
<tr>
<td>Forests have a right to exist for their own sake, regardless of human concerns and uses.</td>
<td>3.87^A (1.17)</td>
<td>3.31^B (1.30)</td>
<td>2.92^c (1.20)</td>
<td>35.6***</td>
</tr>
<tr>
<td>Plants and animals exist primarily for human use.</td>
<td>2.21^A (1.19)</td>
<td>2.52^B (1.21)</td>
<td>2.87^c (1.22)</td>
<td>16.0***</td>
</tr>
<tr>
<td>We must be prepared to sacrifice environmental quality for economic growth.</td>
<td>1.96^A (1.08)</td>
<td>2.15^A (1.05)</td>
<td>2.40^B (1.05)</td>
<td>8.6**</td>
</tr>
</tbody>
</table>
Table 4-7, Continued.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Scale mean</th>
<th>Scale s.d.</th>
<th>Cronbach alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>We should actively harvest more timber to meet the needs of a much larger human population.</td>
<td>1.90A (1.17)</td>
<td>2.29B (1.15)</td>
<td>2.62C (1.20)</td>
</tr>
<tr>
<td>Forests outside wilderness should be used primarily for timber and wood products.</td>
<td>2.43A (1.11)</td>
<td>2.68B (1.17)</td>
<td>2.81B (1.17)</td>
</tr>
<tr>
<td>The environmental laws and regulations currently on the books have gone too far already.</td>
<td>2.39A (1.33)</td>
<td>3.10B (1.47)</td>
<td>3.63C (1.22)</td>
</tr>
<tr>
<td>Scale mean</td>
<td>3.91A (0.76)</td>
<td>3.51B (0.86)</td>
<td>3.23C (0.71)</td>
</tr>
<tr>
<td>Scale s.d.</td>
<td>0.88</td>
<td>0.82</td>
<td>0.90</td>
</tr>
<tr>
<td>Cronbach alpha</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTE: 1) The scale used for individual items was =strongly disagree to 5=strongly agree. For the scale average, items were recoded so that higher numbers reflect a biocentric position and lower numbers reflect an anthropocentric position. 2)** Significant at p<0.001, *** Significant at p<0.0001 3)Superscript letters indicate significant differences (at 0.05 level, two-tailed t-test) between groups for each item.

Support for Management Actions

This scale (Table 4-8) measured support for different management actions (mostly regulations) that would help in protecting the wilderness resource. This scale was modified from the "wildernism" and "wilderness purism" scales developed by Hendee et al. (1968) and Stankey (1973). This measure relates to personal standards, testing the hypothesis that "the more a person thinks human impacts on wilderness are unacceptable and should be minimized, the more likely s/he is to be in conflict with other users" (H2, p. 38).

The same tendency as with the case of the environmental attitudes scale was present in this scale (Table 4-8); hikers were most supportive for protecting wilderness even if it meant restrictions on use, while stock users were least supportive. In five out of the seven items, stock users on the average agreed when hikers disagreed and vice versa. Only on one item, ("Parts of the Eagle Cap Wilderness should be closed to all recreational use"), were all the groups on the same side,
Table 4-8. "Support for management actions" scale and individual scale variable items by three modes of travel.

<table>
<thead>
<tr>
<th>Item Description</th>
<th>Hikers Mean (s.d.)</th>
<th>Doing Both Mean (s.d.)</th>
<th>Stock Users Mean (s.d.)</th>
<th>F-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>If recreation threatens the ecological conditions of the Eagle Cap Wilderness,</td>
<td>4.07^A (1.08)</td>
<td>3.34^B (1.36)</td>
<td>2.76^C (1.38)</td>
<td>68.2***</td>
</tr>
<tr>
<td>recreation use should be restricted.</td>
<td>n=500</td>
<td>n=121</td>
<td>n=121</td>
<td></td>
</tr>
<tr>
<td>Parts of the Eagle Cap Wilderness should be closed to all recreational use.</td>
<td>2.62^A (1.29)</td>
<td>1.82^B (1.11)</td>
<td>1.90^B (1.18)</td>
<td>29.1***</td>
</tr>
<tr>
<td></td>
<td>n=465</td>
<td>n=118</td>
<td>n=119</td>
<td></td>
</tr>
<tr>
<td>Recreational use of the Eagle Cap Wilderness should be restricted in crowded</td>
<td>3.65^A (1.01)</td>
<td>3.08^B (1.26)</td>
<td>2.71^C (1.20)</td>
<td>41.9***</td>
</tr>
<tr>
<td>areas if the opportunities for solitude are lost.</td>
<td>n=489</td>
<td>n=116</td>
<td>n=117</td>
<td></td>
</tr>
<tr>
<td>Fish stocking with non-native fish is appropriate in wilderness.</td>
<td>2.42^A (1.15)</td>
<td>2.74^B (1.31)</td>
<td>3.03^B (1.22)</td>
<td>13.3***</td>
</tr>
<tr>
<td></td>
<td>n=454</td>
<td>n=117</td>
<td>n=114</td>
<td></td>
</tr>
<tr>
<td>The Eagle Cap Wilderness should provide more facilities for stock use.</td>
<td>2.14^A (0.94)</td>
<td>2.84^B (1.14)</td>
<td>3.36^C (1.08)</td>
<td>77.6***</td>
</tr>
<tr>
<td></td>
<td>n=436</td>
<td>n=113</td>
<td>n=117</td>
<td></td>
</tr>
<tr>
<td>Commercial livestock grazing (sheep, cattle) should continue to be allowed as</td>
<td>2.33^A (1.26)</td>
<td>2.67^B (1.41)</td>
<td>3.53^C (1.36)</td>
<td>41.2***</td>
</tr>
<tr>
<td>appropriate use of wilderness areas.</td>
<td>n=489</td>
<td>n=121</td>
<td>n=120</td>
<td></td>
</tr>
<tr>
<td>Scale mean</td>
<td>3.57^A</td>
<td>2.97^B</td>
<td>2.56^C</td>
<td>94.1***</td>
</tr>
<tr>
<td>Scale s.d.</td>
<td>(0.68)</td>
<td>(0.80)</td>
<td>(0.71)</td>
<td></td>
</tr>
<tr>
<td>Cronbach alpha</td>
<td>0.65</td>
<td>0.71</td>
<td>0.60</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: 1) The scale used for individual items was 1=strongly disagree to 5=strongly agree. For the scale average, items were recoded so that higher numbers reflect a more supportive attitude toward protecting the wilderness by applying restrictions than lower numbers.
2) * Significant at p<0.01, ** Significant at p<0.001, *** Significant at p<0.0001
3) Superscript letters indicate significant differences (at 0.05 level, two-tailed t-test) between groups for each item.
although even then there were statistically significant differences in the level of agreement/disagreement. Thus, there was a clear tendency for hikers to be more supportive of restrictions to protect the wilderness resource than stock users; a result found in other studies as well (Watson et al., 1993; Shindler & Shelby, 1993).

The statement "Wilderness areas are primarily for recreational purposes" had item-total correlations lower than 0.3 and would have reduced the Cronbach alpha of this scale from 0.71 to 0.69 for doing both and from 0.60 to 0.54 for stock users. Therefore, it was kept separate in the regression model and its statistics are presented in table 4-9. The differences between the three travel modes in regard to the question were not drastic, albeit statistically significant, and they were toward the same direction as with the "support for management actions scale" and the environmental opinions scale. Stock users and doing both valued wildernesses more as recreation areas whereas hikers were more likely to view wilderness areas having other purposes as well.

Table 4-9. Responses to the statement "Wilderness areas are primarily for recreational purposes" by three modes of travel.¹

<table>
<thead>
<tr>
<th></th>
<th>hikers</th>
<th>doing both</th>
<th>stock users</th>
</tr>
</thead>
<tbody>
<tr>
<td>mean</td>
<td>3.07^A</td>
<td>3.48^B</td>
<td>3.31^B</td>
</tr>
<tr>
<td>standard deviation</td>
<td>1.27</td>
<td>1.18</td>
<td>1.27</td>
</tr>
<tr>
<td>n</td>
<td>494</td>
<td>121</td>
<td>121</td>
</tr>
</tbody>
</table>

¹ Measured with 5-point Likert scale ranging from 1=strongly disagree to 5=strongly agree. F=6.1, p<0.01 (one-way analysis of variance for unbalanced designs). Superscript letters indicate significant differences (at 0.05 level, two-tailed t-test) between groups.
importance of solitude, perceived differences between hikers and stock users, tolerance for stock users

These three measures are introduced together because findings with regard to them are similar. Hikers place most value on solitude as a goal of their wilderness experience (Table 4-10), are more likely to perceive hikers and stock users as different from one another (Table 4-11), and are least tolerant of stock users (Table 4-12), while stock users score lowest on each of these scales. Thus, the hypotheses related to these scales (H3, H4, and H6, p. 38) get support from this preliminary analysis, but remain yet to be tested more rigorously in the prediction model. Those visitors classified as "doing both" fall between the two other user groups and are significantly different from both, except in the case of perceived differences between hikers and stock users.

Importance of solitude scale (Table 4-10) consisted of three items and was developed specifically for this study. Solitude can be viewed as one of the central motives for wilderness trips (Stankey & Schreyer, 1987). There were significant differences between the groups on the solitude scale, which indicates that the groups have different motives for their wilderness trips. On all the items of the solitude scale, hikers agree when stock users disagree and vice versa, and the same pattern is reflected in scale means; stock users slightly disagree that solitude is an important motive for their visits to the Eagle Cap Wilderness, whereas hikers agree. On this scale, people having traveled both by foot and with stock are closer to hikers than to stock users, while on the other scales, those doing both are generally closer to stock users.
Table 4-10. "Importance of solitude" scale and individual scale variable items by three modes of travel.

<table>
<thead>
<tr>
<th>It's most enjoyable when you don't see anyone else in the wilderness except your own group.</th>
<th>hikers mean (s.d.)</th>
<th>doing both mean (s.d.)</th>
<th>stock users mean (s.d.)</th>
<th>F-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3.57^A</td>
<td>3.49^A</td>
<td>2.99^B</td>
<td>12.3***</td>
</tr>
<tr>
<td>n=501</td>
<td>(1.12)</td>
<td>(1.22)</td>
<td>(1.23)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>It doesn't matter to me if there are hiking groups camped within sight or sound of my camp.</th>
<th>hikers mean (s.d.)</th>
<th>doing both mean (s.d.)</th>
<th>stock users mean (s.d.)</th>
<th>F-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.60^A</td>
<td>2.67^A</td>
<td>3.15^B</td>
<td>12.9***</td>
</tr>
<tr>
<td>n=488</td>
<td>(1.04)</td>
<td>(1.18)</td>
<td>(1.09)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>It doesn't matter to me if there are stock groups camped within sight or sound of my camp.</th>
<th>hikers mean (s.d.)</th>
<th>doing both mean (s.d.)</th>
<th>stock users mean (s.d.)</th>
<th>F-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.16^A</td>
<td>2.87^B</td>
<td>3.35^C</td>
<td>66.2***</td>
</tr>
<tr>
<td>n=493</td>
<td>(1.06)</td>
<td>(1.30)</td>
<td>(1.06)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scale mean</th>
<th>hikers mean (s.d.)</th>
<th>doing both mean (s.d.)</th>
<th>stock users mean (s.d.)</th>
<th>F-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3.63^A</td>
<td>3.32^B</td>
<td>2.85^C</td>
<td>37.6***</td>
</tr>
<tr>
<td>n=501</td>
<td>(0.83)</td>
<td>(1.04)</td>
<td>(0.90)</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: 1) The scale used for individual items was 1=strongly disagree to 5=strongly agree. For the scale average, items were recoded so that higher numbers reflect that a person values more solitude than a person scoring low on the scale.
2)** Significant at p<0.001, *** Significant at p<0.0001
3) Superscript letters indicate significant differences (at 0.05 level, two-tailed t-test) between groups for each item.

Perceived similarities/ differences scale (Table 4-11) consisted of four items asking whether respondents perceived hikers and stock users as similar to or different from one another. These statements were modified from Adelman et al. (1982) and Watson et al. (1993). This is the only attitude scale where the group classified as doing both differs from hikers more than stock users. It is not surprising that the doing both group perceives hikers and stock users as being quite similar. They are a group that has traveled both by foot and with stock in the Eagle Cap Wilderness and thereby the questions ask them to compare whether they think they are different from themselves depending on which way they travel.
The attitude scales on political orientation, environmental opinions, support for management actions, and importance of solitude have indicated that significant differences do exist between hikers and stock users in regard to the items in perceived differences scale. Hikers (who are more in conflict with stock users than vice versa) are more likely than stock users to perceive those differences. This provides preliminary support for the hypothesis that perceived differences contribute to conflict (H₆), but this will be tested more rigorously in the prediction model.

Table 4-11. "Perceived differences of hikers and stock users" scale and individual scale variable items by three modes of travel.

<table>
<thead>
<tr>
<th></th>
<th>Hikers mean (s.d.)</th>
<th>doing both mean (s.d.)</th>
<th>stock users mean (s.d.)</th>
<th>F-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hikers and stock users have similar attitudes about environmental issues.</td>
<td>2.50A (1.06) n=435</td>
<td>3.14B (1.14) n=121</td>
<td>3.15B (1.32) n=118</td>
<td>25.7***</td>
</tr>
<tr>
<td>Stock users and hikers hold similar values toward wilderness areas.</td>
<td>2.73A (1.04) n=432</td>
<td>3.53B (1.03) n=116</td>
<td>3.52B (1.17) n=116</td>
<td>42.2***</td>
</tr>
<tr>
<td>Hikers and stock users have different lifestyles.</td>
<td>3.47A (0.92) n=420</td>
<td>3.05B (1.12) n=110</td>
<td>3.28A/B (1.21) n=102</td>
<td>7.9**</td>
</tr>
<tr>
<td>Stock users and hikers come to wilderness areas for different reasons.</td>
<td>3.05A (0.98) n=443</td>
<td>2.41B (0.99) n=117</td>
<td>2.78C (1.22) n=114</td>
<td>18.5***</td>
</tr>
<tr>
<td>Scale mean</td>
<td>3.35A (0.76)</td>
<td>2.69B (0.81)</td>
<td>2.81B (0.91)</td>
<td>37.0***</td>
</tr>
<tr>
<td>Scale s.d.</td>
<td>0.76</td>
<td>0.72</td>
<td>0.74</td>
<td></td>
</tr>
</tbody>
</table>

NOTE: 1) The scale used for individual items was 1=strongly disagree to 5=strongly agree. For the scale average, items were recoded so that higher numbers reflect a person perceiving the two groups as being different from one another and lower scores a person perceiving the two groups as being relatively similar.
2)** Significant at p<0.001, *** Significant at p<0.0001
3) Superscript letters indicate significant differences (at 0.05 level, two-tailed t-test) between groups for each item.
The tolerance for stock use (Table 4-12) scale consisted of three questions modified for the present study from Ivy et al. (1992). As a scale, it was used only in predicting conflict toward stock users. However, one question ("Stock use and hiking are compatible with each other in wilderness areas") was tested also as a predictor of conflict toward hikers.

Table 4-12. "Tolerance for stock users" scale and individual scale variable items by three modes of travel.

<table>
<thead>
<tr>
<th></th>
<th>hikers mean (s.d.)</th>
<th>doing both mean (s.d.)</th>
<th>stock users mean (s.d.)</th>
<th>F-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stock use and hiking are compatible with one another in wilderness areas.</td>
<td>3.05A (1.11)</td>
<td>3.95B (0.84)</td>
<td>4.09B (0.77)</td>
<td>73.1***</td>
</tr>
<tr>
<td>Parts of the Eagle Cap Wilderness should be closed to stock but open to hiking.</td>
<td>3.83A (1.13)</td>
<td>2.50B (1.44)</td>
<td>1.65C (0.99)</td>
<td>195.8***</td>
</tr>
<tr>
<td>The Eagle Cap Wilderness should be a place with no horses allowed.</td>
<td>2.52A (1.09)</td>
<td>1.57B (0.84)</td>
<td>1.20C (0.52)</td>
<td>116.4***</td>
</tr>
<tr>
<td>Scale mean</td>
<td>3.11A (0.90)</td>
<td>2.02B (0.84)</td>
<td>1.58C (0.56)</td>
<td>195.9***</td>
</tr>
<tr>
<td>Scale s.d.</td>
<td>0.74</td>
<td>0.69</td>
<td>0.52</td>
<td></td>
</tr>
<tr>
<td>Cronbach alpha</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTE: 1) The scale used for individual items was 1=strongly disagree to 5=strongly agree. For the scale average, items were recoded so that higher numbers reflect a person tolerant of stock users and lower scores a person less tolerant of stock users. 2)** Significant at p<0.001, *** Significant at p<0.0001 3)Superscript letters indicate significant differences (at 0.05 level, two-tailed t-test) between groups for each item.

The tolerance scale revealed more extreme differences between the three groups than any other scale. It is hardly surprising that most stock users strongly opposed closing the whole wilderness to stock use as that would mean they would lose their recreational opportunities altogether, and they viewed wilderness areas to be primarily for recreational purposes (Table 4-9). However, hikers somewhat opposed closure of
the Eagles Cap to horses as well. More drastic is the difference in opinions to closing parts of the Eagle Cap Wilderness to stock; hikers clearly support that option whereas stock users strongly oppose it. The same difference in opinions has been found in other studies as well (Watson et al., 1993; Shindler & Shelby, 1993). In the event that managers might consider closing parts of the wilderness to stock users, stock users' resistance to this issue should be further explored. This question was vague; e.g., respondents did not know what specific areas within the wilderness might be involved. There might well be a possibility of compromise if the areas and their proportions are specified.

The reliability of the tolerance scale for stock users is unacceptably low. However, as mentioned above, that was not a concern in the prediction model because the purpose of the study was to predict only intergroup conflict, and therefore stock users' tolerance toward stock users was not needed to test any of the hypotheses.

**Perceived Ecological Impacts**

Perceived ecological impacts was a new measure developed specifically for this study to test the hypothesis about beliefs: "a person in conflict with other users perceives other users to have stronger ecological impacts on the wilderness than a person not in conflict with other users" (H₇, p. 38). The measure consisted of four questions asking users' perceptions of the impacts of stock users and two questions asking users' perceptions of the impact of hikers (question #16 in the questionnaire, Appendix C). All the user groups differed significantly from one another in their perception of ecological impacts of stock users with hikers perceiving stock users having highest impact on the ecological conditions of the Eagle Cap Wilderness (Table 4-13).
Table 4-13. Perceptions of ecological impacts of stock use by three modes of travel.1

<table>
<thead>
<tr>
<th></th>
<th>hikers</th>
<th>doing both</th>
<th>stock users</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>mean</strong></td>
<td>3.69\textsuperscript{A}</td>
<td>2.90\textsuperscript{B}</td>
<td>2.39\textsuperscript{C}</td>
</tr>
<tr>
<td><strong>standard deviation</strong></td>
<td>0.95</td>
<td>0.95</td>
<td>0.94</td>
</tr>
<tr>
<td><strong>n</strong></td>
<td>443</td>
<td>115</td>
<td>104</td>
</tr>
<tr>
<td><strong>Cronbach alpha</strong></td>
<td>0.96</td>
<td>0.96</td>
<td>0.97</td>
</tr>
</tbody>
</table>

1Measured with a 5-point Likert scale ranging from 1=no impact at all to 5=serious impacts. F=96.0, p<0.0001 (one-way anova for unbalanced designs), superscript letters indicate significant differences (at 0.05 level, two-tailed t-test) between groups.

In terms of respondents' perceptions of ecological impacts of hikers, there was a less strong but still significant, difference with stock users perceiving hikers having less impacts than hikers themselves (Table 4-14).

Table 4-14. Perceptions of ecological impacts of hiking by three modes of travel.1

<table>
<thead>
<tr>
<th></th>
<th>hikers</th>
<th>doing both</th>
<th>stock users</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>mean</strong></td>
<td>2.44\textsuperscript{A}</td>
<td>2.32\textsuperscript{B}</td>
<td>2.24\textsuperscript{B}</td>
</tr>
<tr>
<td><strong>standard deviation</strong></td>
<td>0.75</td>
<td>0.80</td>
<td>0.88</td>
</tr>
<tr>
<td><strong>n</strong></td>
<td>461</td>
<td>114</td>
<td>104</td>
</tr>
<tr>
<td><strong>Pearson's r</strong></td>
<td>0.6</td>
<td>0.78</td>
<td>0.81</td>
</tr>
</tbody>
</table>

1Measured with a 5-point Likert scale ranging from 1=no impact at all to 5=serious impacts. F=3.2, p=0.04 (one-way anova for unbalanced designs), superscript letters indicate significant differences (at 0.05 level, two-tailed t-test) between groups.

When comparing the perceived impacts of hikers and stock users within a user group (across Tables 4-13 and 4-14), it appears that stock users on the average feel that hikers and stock users have about the same amount of impact on nature (2.4 vs.
2.2) whereas hikers perceive that stock users have significantly more impacts than hikers (3.7 vs. 2.4). Again, the group that has done both hiking and traveling with stock in the Eagle Cap falls between the two other groups (2.9 vs. 2.3) in their opinions.

**Degree and Asymmetry of Conflict**

The first hypothesis of the study (H1) was that there is an asymmetric conflict between hikers and stock users in the Eagle Cap Wilderness with hikers reporting conflict with stock users significantly more often than vice versa. Because the asymmetric nature of many recreational conflicts has been discussed in the literature, suffice to recall that in an asymmetric, one-way conflict one group dislikes the other significantly more than the reverse (Adelman et al., 1982). Asymmetric conflicts are common in recreational settings (e.g., Lucas et al., 1964; Adelman et al., 1982), and have been found to exist also between hikers and stock users in several wilderness areas (Watson et al., 1993).

The first conflict measure (question #11 in the questionnaire, Appendix C) asked visitors to express their feelings about meeting other users using a like/dislike measure. It revealed that none of the groups (hikers, stock users, doing both) was significantly in conflict with hikers (Table 4-15). Only 6 to 8 percent of those users that had met hikers in the Eagle Cap Wilderness reported disliking meeting hikers and the groups were not significantly different from one another in their ratings of liking/disliking of hikers. On the other hand, when visitors were asked to report their feelings about meeting stock users, significant differences emerged (Table 4-16). After having excluded those who had never met stock users in the Eagle Cap Wilderness (10 to 19 percent of users), almost 42% of hikers and 13% of doing both reported disliking meeting stock users, while the majority of stock users enjoyed meeting stock users. Thus, the perceived conflict was clearly asymmetric among the user groups; almost half of the hikers who had met stock users, disliked meeting them, but only 8% of stock users disliked meeting hikers (Tables 4-15 and 4-16). The
degree of asymmetry of the conflict was about the same as what Watson et al. (1993) found to exist in three wilderness areas. The conclusions remained the same when means were compared (Table 4-17); hikers on the average slightly disliked meeting stock users but enjoyed meeting hikers whereas stock users enjoyed meeting both groups. As with most of the attitude measures, those people who travelled both ways fell again between hikers and stock users; they disliked meeting stock users more than people who exclusively used stock, but less than those who exclusively hiked (Tables 4-16 and 4-17).

The finding that there is no significant conflict within any user group, i.e., hikers mostly are neutral or enjoy meeting hikers and stock users mostly are neutral or enjoy meeting stock users, could be explained by attraction theory (Newcomb, 1956; 1961), which maintains that people similar to one another are more likely to not be in conflict. It is likely that hikers perceive themselves similar to other hikers and stock users perceive themselves similar to other stock users. In other words, perception of "sameness" and feeling of belonging to the group are related to the lack of conflict.

Table 4-15. How visitors feel about meeting hikers in the Eagle Cap Wilderness.¹

<table>
<thead>
<tr>
<th>respondent's mode of travel</th>
<th>disliked (%)</th>
<th>neutral (%)</th>
<th>enjoyed (%)</th>
<th>N for those who have met hikers</th>
<th>never met hikers (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>hikers</td>
<td>6</td>
<td>33</td>
<td>61</td>
<td>468</td>
<td>10</td>
</tr>
<tr>
<td>doing both</td>
<td>8</td>
<td>36</td>
<td>56</td>
<td>118</td>
<td>5</td>
</tr>
<tr>
<td>stock users</td>
<td>8</td>
<td>41</td>
<td>51</td>
<td>110</td>
<td>12</td>
</tr>
</tbody>
</table>

¹Pearson's chi-square =3.022, p=0.554

NOTE: For the purposes of this analysis, the original scale used for individual items (1=enjoy meeting them a lot to 7=dislike meeting them a lot) was collapsed into three categories: 1-3=enjoy meeting them, 4=neutral, 5-7=dislike meeting them.
Table 4-16. How visitors feel about meeting stock users in the Eagle Cap Wilderness.¹

<table>
<thead>
<tr>
<th>respondent's mode of travel</th>
<th>disliked (%)</th>
<th>neutral (%)</th>
<th>enjoyed (%)</th>
<th>N for those who have met stock users</th>
<th>never met stock users (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>hikers</td>
<td>42</td>
<td>27</td>
<td>31</td>
<td>419</td>
<td>19</td>
</tr>
<tr>
<td>doing both</td>
<td>13</td>
<td>32</td>
<td>55</td>
<td>112</td>
<td>10</td>
</tr>
<tr>
<td>stock users</td>
<td>4</td>
<td>33</td>
<td>63</td>
<td>104</td>
<td>17</td>
</tr>
</tbody>
</table>

¹Pearson's chi-square= 91.1, p<0.0001

NOTE: For the purposes of this analysis, the original scale used for individual items (1=enjoy meeting them a lot to 7=dislike meeting them a lot) was collapsed into three categories: 1-3=enjoy meeting them, 4=neutral, 5-7=dislike meeting them.

Table 4-17. How visitors feel about meeting other user groups in the Eagle Cap Wilderness.

<table>
<thead>
<tr>
<th></th>
<th>hikers mean (s.d.)</th>
<th>doing both mean (s.d.)</th>
<th>stock users mean (s.d.)</th>
<th>F-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>feelings about</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>meeting hikers</td>
<td>2.95 (1.24)</td>
<td>3.09 (1.40)</td>
<td>2.95 (1.50)</td>
<td>F=0.58</td>
<td>p=0.5579</td>
</tr>
<tr>
<td></td>
<td>n=468</td>
<td>n=118</td>
<td>n=110</td>
<td></td>
<td></td>
</tr>
<tr>
<td>feelings about</td>
<td>4.24 (1.58)</td>
<td>3.20 (1.34)</td>
<td>2.57 (1.34)</td>
<td>F=60.7</td>
<td>p=0.0001</td>
</tr>
<tr>
<td>meeting stock users</td>
<td>n=419</td>
<td>n=112</td>
<td>n=104</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTE:
1) The scale used for individual items was 1=enjoy meeting them a lot to 7=dislike meeting them a lot, with 4 being neutral. Feelings about meeting hikers -measure consisted of two questions that correlated strongly with one another (r=0.79 for hikers, r=0.98 for those doing both, and r=0.83 for stock users) and feelings about meeting stock users -measure consisted of four questions that correlated strongly with one another (Cronbach alpha=0.98 for each mode of travel).
2) Superscript letters indicate significant differences (at 0.05 level, two-tailed t-test) between groups for each item.

The second measure of conflict (questions #13 and #14 in the questionnaire, Appendix C) asked visitors if they had ever been bothered by different types of users. With this measure of conflict, the asymmetry was less strong but still present (Table
The three groups were again significantly different (p<0.0001) in their reactions toward stock users with hikers being bothered most by stock users. However, in contrast with the like/dislike measure, stock users are significantly more antagonistic toward hikers as well. In addition to possibly measuring different aspects of conflict, increased antagonism of stock users toward hikers could be due to the differences in response categories; the second measure provided only neutral or negative options whereas the first measure (like/dislike) provided also an opportunity to express positive feelings. Again, the direction of the findings is similar to Watson et al. (1993) although these two studies used somewhat different wording in this measure and therefore cannot be compared directly.

Table 4-18. How visitors report disturbance from other visitors in the Eagle Cap Wilderness.

<table>
<thead>
<tr>
<th>Bothered by the number of hikers (%)</th>
<th>Not at all</th>
<th>Very little</th>
<th>Somewhat</th>
<th>A lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>hikers (n=509)</td>
<td>60</td>
<td>30</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>doing both (n=124)</td>
<td>51</td>
<td>31</td>
<td>15</td>
<td>3</td>
</tr>
<tr>
<td>stock users (n=125)</td>
<td>74</td>
<td>19</td>
<td>3</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bothered by particular types of hikers (%)</th>
<th>Not at all</th>
<th>Very little</th>
<th>Somewhat</th>
<th>A lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>hikers (n=503)</td>
<td>63</td>
<td>24</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>doing both (n=119)</td>
<td>56</td>
<td>27</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td>stock users (n=125)</td>
<td>74</td>
<td>15</td>
<td>8</td>
<td>3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bothered by the behavior of hikers (%)</th>
<th>Not at all</th>
<th>Very little</th>
<th>Somewhat</th>
<th>A lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>hikers (n=510)</td>
<td>56</td>
<td>28</td>
<td>14</td>
<td>3</td>
</tr>
<tr>
<td>doing both (n=124)</td>
<td>50</td>
<td>26</td>
<td>15</td>
<td>9</td>
</tr>
<tr>
<td>stock users (n=123)</td>
<td>66</td>
<td>20</td>
<td>12</td>
<td>2</td>
</tr>
</tbody>
</table>
Bothered by the number of stock users (%), Pearson's chi-square=84.3, p=0.0001

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>Very little</th>
<th>Somewhat</th>
<th>A lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>hikers (n=513)</td>
<td>43</td>
<td>23</td>
<td>24</td>
<td>11</td>
</tr>
<tr>
<td>doing both (n=123)</td>
<td>56</td>
<td>24</td>
<td>16</td>
<td>4</td>
</tr>
<tr>
<td>stock users (n=124)</td>
<td>86</td>
<td>11</td>
<td>3</td>
<td>0</td>
</tr>
</tbody>
</table>

Bothered by particular types of stock users (%), Pearson's chi-square=36.9, p=0.0001

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>Very little</th>
<th>Somewhat</th>
<th>A lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>hikers (n=505)</td>
<td>53</td>
<td>24</td>
<td>16</td>
<td>6</td>
</tr>
<tr>
<td>doing both (n=122)</td>
<td>62</td>
<td>22</td>
<td>12</td>
<td>3</td>
</tr>
<tr>
<td>stock users (n=124)</td>
<td>82</td>
<td>8</td>
<td>7</td>
<td>2</td>
</tr>
</tbody>
</table>

Bothered by the behavior of stock users (%), Pearson's chi-square=30.4, p=0.0001

<table>
<thead>
<tr>
<th></th>
<th>Not at all</th>
<th>Very little</th>
<th>Somewhat</th>
<th>A lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>hikers (n=508)</td>
<td>54</td>
<td>26</td>
<td>16</td>
<td>5</td>
</tr>
<tr>
<td>doing both (n=123)</td>
<td>61</td>
<td>24</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>stock users (n=124)</td>
<td>80</td>
<td>14</td>
<td>5</td>
<td>2</td>
</tr>
</tbody>
</table>

To further analyze if any trends existed in the second conflict measure (having been bothered by others), all respondents having been bothered to any degree (very little, somewhat, a lot) were collapsed into a general category "bothered by others". In the case of hikers and doing both being bothered by stock users, conflict was most commonly attributed to the numbers of stock users whereas stock users were bothered more often by the behavior of stock users (Table 4-19).

Table 4-19. Percentages of users having been bothered by numbers, types, or behavior of stock users.

<table>
<thead>
<tr>
<th></th>
<th>Numbers (%)</th>
<th>Types (%)</th>
<th>Behavior (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>hikers</td>
<td>58</td>
<td>47</td>
<td>46</td>
</tr>
<tr>
<td>doing both</td>
<td>44</td>
<td>38</td>
<td>39</td>
</tr>
<tr>
<td>stock users</td>
<td>15</td>
<td>18</td>
<td>20</td>
</tr>
</tbody>
</table>
On the other hand, in the case of "being bothered by hikers" measure, the conflict was greatest for all user groups regarding behavioral aspects, and the difference is most clear in the case of stock users being bothered by hikers (Table 4-20).

Table 4-20. Percentages of users having been bothered by numbers, types, or behavior of hikers.

<table>
<thead>
<tr>
<th></th>
<th>Numbers (%)</th>
<th>Types (%)</th>
<th>Behavior (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>hikers</td>
<td>40</td>
<td>37</td>
<td>44</td>
</tr>
<tr>
<td>doing both</td>
<td>49</td>
<td>44</td>
<td>50</td>
</tr>
<tr>
<td>stock users</td>
<td>26</td>
<td>26</td>
<td>34</td>
</tr>
</tbody>
</table>

Thus, it seems that hiker behavior might be a more important factor explaining stock users' conflict toward hikers while the number of stock users seems to bother hikers more than the behavior of the stock users.

Although the second conflict measure (having been bothered by other users) focuses only on the negative side of the interaction, whereas the first conflict measure (like/dislike) provided a possibility of expressing positive feelings as well, these two measures of conflict correlate fairly strongly. In the case of conflict with stock users, it would be justifiable to combine these measures into one scale variable for hikers and doing both. All the item-total correlations were over 0.4 for those two groups and Pearson's correlation coefficients were fairly strong (Table 4-21).
Table 4-21. Correlation of the like/dislike conflict measure toward stock users with the "having been bothered by stock users" conflict measure (as measured by Pearson's correlation coefficient).

<table>
<thead>
<tr>
<th>Measures</th>
<th>Hikers</th>
<th>Doing both</th>
<th>Stock users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numbers</td>
<td>0.58</td>
<td>0.55</td>
<td>0.11</td>
</tr>
<tr>
<td>Type</td>
<td>0.49</td>
<td>0.27</td>
<td>-0.02</td>
</tr>
<tr>
<td>Behavior</td>
<td>0.42</td>
<td>0.19</td>
<td>-0.06</td>
</tr>
<tr>
<td>Cronbach alpha</td>
<td>0.85</td>
<td>0.75</td>
<td>0.62</td>
</tr>
</tbody>
</table>

The low correlations and unacceptably low Cronbach alpha in the scale for stock users in conflict with stock users is not a concern here because this study focuses on intergroup conflicts. It should be noted that to be able to compare the two different conflict measures, all the positive expressions in like/dislike measure had to be converted into neutral. That way almost half of the information was lost and variation reduced. Therefore, the two conflict measures were not combined for the regression analysis. On the other hand, based on the strong correlation between these two measures, the development of regression models was justified only for the like/dislike measure, which had more variation and thus appeared to be more suitable for regression analysis. From the correlations between the like/dislike measure and the second conflict measure (having been bothered by others), it appears that the like/dislike measure is most closely related to being bothered by numbers of stock users.

In the case of the two measures (like/dislike and having been bothered) of conflict toward hikers, the correlations were less strong (Table 4-22).
Table 4-22. Correlation of the like/dislike conflict measure toward hikers with the "having been bothered by hikers" conflict measure (as measured by Pearson's correlation coefficient).

<table>
<thead>
<tr>
<th></th>
<th>Hikers</th>
<th>Doing both</th>
<th>Stock users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Numbers</td>
<td>0.25</td>
<td>0.39</td>
<td>0.24</td>
</tr>
<tr>
<td>Type</td>
<td>0.21</td>
<td>0.12</td>
<td>0.13</td>
</tr>
<tr>
<td>Behavior</td>
<td>0.22</td>
<td>0.14</td>
<td>-0.03</td>
</tr>
<tr>
<td>Cronbach alpha</td>
<td>0.73</td>
<td>0.71</td>
<td>0.69</td>
</tr>
</tbody>
</table>

The Cronbach alpha is still high enough to justify combining the scales but the item-total correlation between like/dislike measure and the rest of the scale does not justify such a step. Nevertheless, a regression analysis predicting stock users and doing both conflict with hikers was performed on the like/dislike measure only. This was because the second conflict measure had very limited variation, and if items do not vary, they cannot covary (DeVellis, 1991, p. 83).

**Self-Reported Reasons for Conflict**

In the conflict measure asking if people had been bothered by other wilderness users, respondents were also asked why they thought they were bothered by hikers and/or stock users. Reasons for having been bothered by stock users were eventually collapsed into 13 categories (Table 4-23), and, for having been bothered by hikers, into 12 categories (Table 4-24). Multiple reasons could be listed; therefore, column percentages add to over 100. Thus, percentages are calculated based on that portion of people who gave a reason for having been bothered by stock users (or hikers, respectively). Because people were not provided with ready response alternatives, statistical comparisons of these frequencies were not calculated and comparisons among these groups should be done with caution. Furthermore, the low number of stock users reporting reasons for disliking either stock users or hikers should be noted.
when comparing percentages. However, several clear differences are worth mentioning and appear consistent with the findings of the prediction model presented in the next chapter.

Hikers were more bothered than those doing both about trail and campsite damage caused by stock users; stock users were never bothered by this factor. On the other hand, stock users were more bothered by people using stock not taking care of the environment. This might mean that hikers think stock users have necessarily stronger impact on the environment whereas stock users think that only those stock users who don't take good care of the environment (e.g., tie horses to trees, let them graze at riparian areas) cause unacceptably high impacts and ruin the reputation for the rest of the stock users as well. This is consistent with the above-described findings that hikers seem to be bothered more by the numbers of stock users, whereas stock users seem to be bothered more by the behavior of stock users (Table 4-19).

Another clear difference was that hikers were bothered most by stock's manure which they perceived as inconvenient, bringing flies, smelling bad, and spreading Giardia whereas few stock users mentioned these reasons. This was also the most common concern in two out of the three wildernesses studied by Watson et al. (1993).

The second most common complaint from hikers in the Eagle Cap Wilderness (trail and campsite damage by stock users) was present only in one of the three wildernesses studied by Watson et al. (1993). On the other hand, Watson et al. (1993) found relatively more complaints about stock users being rude and making too much noise, an infrequent problem in the Eagle Cap Wilderness. However, when comparing the results to the Watson et al. (1993) study, it is important to keep in mind that they asked "to specify the behavior that had interfered with the enjoyment of the wilderness" whereas the present study asked why various features of use --number, type, or behavior-- had bothered the respondent. It is most likely due to the more diverse question form that the present study also yielded more diverse answers. The difference in answers is especially clear in the case of reasons for being disturbed by hikers. Watson et al. (1993) found three main reasons for that (hiking groups making
too much noise, being rude, and drinking alcohol), whereas the current study yielded 11 main categories. Although all of the Watson et al. (1993) categories were present, some of the most common reasons were not behavioral-based (e.g., those who don't like stock users, those who think they own the wilderness). Hikers and doing both complained most about hikers being noisy, leaving trash, and being too many. Stock users cited these problems, but also added their concern with passing hikers on trails. This was the third most common complaint among hikers and doing both who were bothered by stock users, but it is important to notice that some stock users also found that as a problem and that the conflict is not completely one-way (hikers disliking stock users but the reverse not being true).
Table 4-23. Percentages of different reasons reported by respondents who had been bothered by stock users, arranged in an order by frequency mentioned by hikers.

<table>
<thead>
<tr>
<th>Reason for Having Been Bothered by Stock Users:</th>
<th>Hikers</th>
<th>Doing Both</th>
<th>Stock Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>*stock's special features (manure, spreads Giardia, etc.)</td>
<td>54% (105)</td>
<td>12% (4)</td>
<td>5% (1)</td>
</tr>
<tr>
<td>*trail and/or campsite damage</td>
<td>44 (86)</td>
<td>15 (5)</td>
<td>-</td>
</tr>
<tr>
<td>*passing on trails</td>
<td>16 (31)</td>
<td>12 (4)</td>
<td>5 (1)</td>
</tr>
<tr>
<td>*stock itself</td>
<td>12 (24)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>*ecological impacts of stock</td>
<td>12 (23)</td>
<td>24 (8)</td>
<td>5 (1)</td>
</tr>
<tr>
<td>*stock users leaving trash</td>
<td>8 (15)</td>
<td>9 (3)</td>
<td>16 (3)</td>
</tr>
<tr>
<td>*too many of them</td>
<td>7 (14)</td>
<td>18 (6)</td>
<td>8 (2)</td>
</tr>
<tr>
<td>*those who don't take care of the environment</td>
<td>7 (14)</td>
<td>18 (6)</td>
<td>32 (6)</td>
</tr>
<tr>
<td>*rude stock users</td>
<td>6 (12)</td>
<td>9 (3)</td>
<td>21 (4)</td>
</tr>
<tr>
<td>*loud/ noisy stock users</td>
<td>5 (10)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>*different, more intrusive attitude toward wilderness</td>
<td>4 (8)</td>
<td>3 (1)</td>
<td>-</td>
</tr>
<tr>
<td>*outfitters</td>
<td>3 (6)</td>
<td>9 (3)</td>
<td>8 (2)</td>
</tr>
<tr>
<td>*miscellaneous$^2$</td>
<td>9 (18)</td>
<td>21 (7)</td>
<td>21 (4)</td>
</tr>
</tbody>
</table>

| *total number of responses | 366 | 50 | 24 |
| *total number of people giving a reason | 195 | 34 | 19 |

$^1$ Number of times each reason was mentioned.
$^2$ Includes reasons such as drunken stock users, hunters and guns, and "those who think they own it".
Table 4-24. Percentages of different reasons reported by respondents who had been bothered by hikers, arranged in an order by frequency mentioned by stock users.

<table>
<thead>
<tr>
<th>REASON FOR HAVING BEEN BOTHERED BY HIKERS:</th>
<th>HIKERS</th>
<th>DOING BOTH</th>
<th>STOCK USERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>*passing on trails</td>
<td>1% (1)</td>
<td>10% (4)</td>
<td>29% (7)</td>
</tr>
<tr>
<td>*those who don't like stock users</td>
<td>-</td>
<td>5 (2)</td>
<td>21 (5)</td>
</tr>
<tr>
<td>*hikers leaving trash</td>
<td>36 (48)</td>
<td>31 (13)</td>
<td>21 (5)</td>
</tr>
<tr>
<td>*too many of them</td>
<td>23 (31)</td>
<td>27 (11)</td>
<td>17 (4)</td>
</tr>
<tr>
<td>*those who think they own it</td>
<td>1 (1)</td>
<td>12 (5)</td>
<td>13 (3)</td>
</tr>
<tr>
<td>*drunken hikers</td>
<td>9 (12)</td>
<td>2 (1)</td>
<td>8 (2)</td>
</tr>
<tr>
<td>*rude hikers</td>
<td>13 (17)</td>
<td>24 (10)</td>
<td>8 (2)</td>
</tr>
<tr>
<td>*trail damage</td>
<td>5 (7)</td>
<td>-</td>
<td>4 (1)</td>
</tr>
<tr>
<td>*those who don't take care of the environment</td>
<td>10 (13)</td>
<td>12 (5)</td>
<td>4 (1)</td>
</tr>
<tr>
<td>*loud/ noisy hikers</td>
<td>39 (52)</td>
<td>24 (10)</td>
<td>4 (1)</td>
</tr>
<tr>
<td>*large groups</td>
<td>3 (4)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>*miscellaneous(^2)</td>
<td>22 (29)</td>
<td>34 (14)</td>
<td>25 (6)</td>
</tr>
<tr>
<td>*total number of responses</td>
<td>215</td>
<td>75</td>
<td>37</td>
</tr>
<tr>
<td>*total number of people giving a reason</td>
<td>132</td>
<td>41</td>
<td>24</td>
</tr>
</tbody>
</table>

\(^1\) Number of times each reason was mentioned.

\(^2\) Includes such reasons as day hikers, ill-prepared ones, and "high-gear junkies".
Management Actions Suggested by Users

After having answered the conflict questions, respondents were asked "In light of your responses to [previous] questions, what (if anything) would you suggest should be done about the situation?" (question #15 in the questionnaire, Appendix C). Table 4-25 summarizes the answers. Again, multiple reasons could be listed and column percentages therefore add up to over 100. Percentages are calculated based on that portion of respondents who gave a suggestion for improving the situation.

Almost half of the hikers (41%), 27% of doing both, and 13% of stock users had suggestions for improving the situation. This appears consistent with each group's degree of conflict; hikers were most often in conflict and they also had more suggestions for improving the situation. The single most common suggestion by hikers was closure of some areas to stock users; it was suggested by 39% of hikers who responded to this question, or by 16% of all the hikers surveyed. The second most common suggestion by hikers was to restrict numbers of stock and stock users (24% of respondents to this question). Thus, the two most common management actions suggested by hikers focused on how to solve hikers' conflict toward stock. Education, restriction of use in general (not just stock use), stricter rules and enforcement, and better trail maintenance were much less frequently mentioned by hikers (by 9%-14%), as was a complete ban on stock use (8%) and special rules for stock users geared toward minimizing stock's impact (7%).

Similar comparisons of the percentages of the stock users is not justified because of so few responses. As a general pattern, it appears that education and enforcement of rules were most commonly mentioned by stock users. Persons having both hiked and traveled with stock in the Eagle Cap suggested education most often (41%). Finally, some stock users and doing both suggested separate areas and/or trails for stock users and hikers. This further supports the idea presented earlier that although stock users and doing both mostly oppose closing parts of the Eagle Cap Wilderness to stock use (Table 4-12), there might be a potential for a compromise among these groups if each group acknowledges the legitimacy of one another's claims.
Table 4-25. Percentages of different management actions suggested by respondents, arranged in an order by frequency mentioned by hikers.

<table>
<thead>
<tr>
<th>SUGGESTED MANAGEMENT ACTION:</th>
<th>HIKERS</th>
<th>DOING BOTH</th>
<th>STOCK USERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>*prohibit stock from certain areas/ separate trails for hikers and stock users</td>
<td>39% (83)</td>
<td>24% (8)</td>
<td>19% (3)</td>
</tr>
<tr>
<td>*restrict numbers of stock and stock users</td>
<td>24% (51)</td>
<td>3% (1)</td>
<td>-</td>
</tr>
<tr>
<td>*educate users²</td>
<td>14% (30)</td>
<td>41% (14)</td>
<td>31% (5)</td>
</tr>
<tr>
<td>*restrict use in general</td>
<td>11% (24)</td>
<td>21% (7)</td>
<td>6% (1)</td>
</tr>
<tr>
<td>*enforcement and stricter rules</td>
<td>10% (22)</td>
<td>15% (5)</td>
<td>25% (4)</td>
</tr>
<tr>
<td>*better trail maintenance</td>
<td>9% (20)</td>
<td>3% (3)</td>
<td>13% (2)</td>
</tr>
<tr>
<td>*prohibit stock</td>
<td>8% (17)</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>*try to minimize the negative impacts of stock by rules and regulations designed specifically for stock users</td>
<td>7% (14)</td>
<td>6% (2)</td>
<td>6% (1)</td>
</tr>
<tr>
<td>*restrict stock use to certain times</td>
<td>4% (8)</td>
<td>6% (2)</td>
<td>-</td>
</tr>
<tr>
<td>*limit group size</td>
<td>4% (9)</td>
<td>3% (1)</td>
<td>-</td>
</tr>
<tr>
<td>*better design of trails³</td>
<td>1% (2)</td>
<td>9% (3)</td>
<td>-</td>
</tr>
<tr>
<td>*do not encourage any use</td>
<td>1% (3)</td>
<td>3% (1)</td>
<td>6% (1)</td>
</tr>
<tr>
<td>*miscellaneous</td>
<td>6% (12)</td>
<td>9% (3)</td>
<td>18% (3)</td>
</tr>
<tr>
<td>*total number of responses</td>
<td>295</td>
<td>48</td>
<td>20</td>
</tr>
<tr>
<td>*total number of people giving a reason</td>
<td>214</td>
<td>34</td>
<td>16</td>
</tr>
</tbody>
</table>

¹ Number of times each reason was mentioned.
² When not mentioned otherwise, the suggestion is not directed toward any specific group.
³ Includes such ideas as wider trails, loop trails, and "pull-offs".
5. PREDICTION MODEL

Some of the research hypotheses have been addressed in previous chapters. In the following discussion, the potential conflict predictors will be tested more rigorously by using them as independent variables in regression analyses to understand conflict expressed with the like/dislike measure. The regression models presented here focus on conflict with the out-group (i.e., hikers toward stock users and stock users toward hikers) because some of the hypotheses and thereby some independent variables (perceived differences, tolerance) were designed specifically for testing conflict with the out-group. For those visitors who had both hiked and traveled with stock in the Eagle Cap Wilderness, either hikers or stock users can be their out-group, depending on the way they are traveling on any specific trip. Therefore, regression models for the "doing both" group were done both toward hikers as well as toward stock users. With an indicator variable for the mode of travel it was tested that regression models for doing both and hikers were not significantly different (i.e., the t-value of the indicator variable for the mode of travel was not significant). However, the models for these two groups were kept separate because they differed significantly with regard to two variables (i.e., perceived differences between hikers and stock users and support for management actions). A similar kind of test was done for the model predicting the conflict of stock users and doing both toward hikers, and the conclusions were the same; although the t-value of the indicator variable was non-significant, one variable appeared to be significant in one model but not in the other. Therefore, these two groups were kept separate in the analysis.

In order to compare the relative significance of each independent variable in predicting conflict of hikers and doing both toward stock users (or stock users and doing both conflict toward hikers, respectively), all variables that proved significant at the $p<0.05$ level in either one of the models were retained in both models. Then, each variable was multiplied by an indicator variable for the mode of travel. If this product variable turned out to be significant, it meant that the correlation coefficients differed
significantly from one another for this variable in the two models. In those cases, the significance levels of the coefficients were reported separately for both models. On the other hand, if the correlation coefficients of the two models did not differ significantly, only one p-value denoting the statistical significance level was given to ease the interpretation.

Based on analyses of scattergrams, it was tested that the relationships between the variables were linear and that the residuals were randomly distributed. The only underlying assumption that was not met, was the independence of predictor variables. Many of the independent variables appeared to correlate significantly with one another, causing a multicollinearity situation. Therefore, the relative significance of each variable should be analyzed with caution because the correlation between the independent variables affects their significance levels. For this reason, the simple correlations for dependent variables with each independent variable were also presented and analyzed. The actual sizes of regression coefficients should not be compared because the regression coefficients are not standardized.

First it was tested whether any of the control variables appeared to have significant influence on conflict experienced by users. None of the socio-demographic variables (age, gender, level of education, income level, size of the current community, size of the community where respondent grew up), group size, membership in environmental organizations, or whether a person was a day or an overnight visitor had significant (p<0.05) regression coefficients in the full models.

After having done the final models, where only variables that were significant at 0.5 level were left (Table 5-2, 5-4), it was further ensured that the regression coefficients for the variables that were left out from the model were likely to be zero (H₀=all the regressions coefficients left out from the final model are zero) by calculating an F-statistic:
F-value
degrees of freedom
F to be significant at 0.05 level
F to be significant at 0.01 level

\[ F_{(df_R - df_F), df_F} = \frac{(SS_R - SS_F)}{(df_R - df_F)} \]

where \( SS_R \) = sum of squared residuals from fit of reduced model
\( SS_F \) = sum of squared residuals from fit of full model
\( df_R \) = degrees of freedom for the reduced model
\( df_F \) = degrees of freedom for the full model.

As all the F-values are smaller than the critical F, the \( H_0 \) is not rejected (Table 5-1).

### Table 5-1. F-values for comparisons of full and reduced regression models.

<table>
<thead>
<tr>
<th></th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-value</td>
<td>1.21</td>
<td>0.76</td>
<td>1.01</td>
<td>1.05</td>
</tr>
<tr>
<td>degrees of freedom</td>
<td>57,278</td>
<td>18,74</td>
<td>31,56</td>
<td>31,69</td>
</tr>
<tr>
<td>F to be significant at 0.05 level</td>
<td>1.38</td>
<td>1.74</td>
<td>1.66</td>
<td>1.62</td>
</tr>
<tr>
<td>F to be significant at 0.01 level</td>
<td>1.28</td>
<td>1.54</td>
<td>1.48</td>
<td>1.45</td>
</tr>
</tbody>
</table>

### Conflict of Hikers and Doing Both toward Stock Users

The two models predicting conflict of hikers and doing both toward stock users appeared to explain about the same amount of variance of the conflict variable (54% and 50%, respectively). They are presented in table 5-2 (Models 1 and 2). First, the model predicting hikers' conflict toward stock users (Model 1) is analyzed, after which the model of doing both (Model 2) is presented and compared to model 1.
Table 5-2. Multiple regression models of potential conflict variables for hikers and doing both on their conflict with stock users (Models 1 and 2).

<table>
<thead>
<tr>
<th></th>
<th>MODEL 1: HIKERS</th>
<th>MODEL 2: DOING BOTH</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>regression coefficients</td>
<td>p&lt;sub&gt;a&lt;/sub&gt;</td>
</tr>
<tr>
<td>Importance of solitude</td>
<td>0.437</td>
<td>0.443</td>
</tr>
<tr>
<td>Tolerance for stock users</td>
<td>0.753</td>
<td>0.484</td>
</tr>
<tr>
<td>Indicators for previous wilderness experience&lt;sup&gt;6&lt;/sup&gt;:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Locals</td>
<td>-0.296</td>
<td>-0.086</td>
</tr>
<tr>
<td>Collectors</td>
<td>-0.263</td>
<td>0.052</td>
</tr>
<tr>
<td>Beginners</td>
<td>-0.426</td>
<td>-0.189</td>
</tr>
<tr>
<td>Political orientation</td>
<td>0.074</td>
<td>0.189</td>
</tr>
<tr>
<td>Perceived differences</td>
<td>0.421</td>
<td>0.092</td>
</tr>
<tr>
<td>Support for management actions</td>
<td>-0.047</td>
<td>0.512</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.838</td>
<td>-1.740</td>
</tr>
<tr>
<td>Adjusted R-square</td>
<td>54.0%</td>
<td>50.0%</td>
</tr>
<tr>
<td>N</td>
<td>344</td>
<td>101</td>
</tr>
</tbody>
</table>

1 p-value for t for model 1 when the coefficients of the two models do differ significantly
2 p-value for t for model 2 when the coefficients of the two models do differ significantly
3 a combined p-value for t for both models when the coefficients of the two models do not differ significantly
4 p-value that indicates the significance of difference between the coefficients of the two models
5 H<sub>0</sub>: β<sub>a</sub>=0; H<sub>a</sub>: β<sub>a</sub>≠0
6 The reference group left out from the model is veterans.

Table 5-3. Simple correlations between the continuous predictor variables and hikers' and doing both's conflict with stock users.

<table>
<thead>
<tr>
<th></th>
<th>hikers</th>
<th>doing both</th>
</tr>
</thead>
<tbody>
<tr>
<td>Importance of solitude</td>
<td>0.45***</td>
<td>0.57***</td>
</tr>
<tr>
<td>Tolerance for stock users</td>
<td>0.66***</td>
<td>0.53***</td>
</tr>
<tr>
<td>Political orientation</td>
<td>-0.13**</td>
<td>-0.13</td>
</tr>
<tr>
<td>Perceived differences</td>
<td>0.56***</td>
<td>0.35***</td>
</tr>
<tr>
<td>Support for management actions</td>
<td>0.39***</td>
<td>0.61***</td>
</tr>
<tr>
<td>Perceived ecological impacts of stock</td>
<td>0.46***</td>
<td>0.40***</td>
</tr>
<tr>
<td>Environmental attitudes</td>
<td>0.21***</td>
<td>0.47***</td>
</tr>
<tr>
<td>Wilderness areas are primarily for recreational purposes</td>
<td>-0.06</td>
<td>-0.27**</td>
</tr>
</tbody>
</table>

*** Significant at p<0.001, ** Significant at p<0.01
In the case of hikers' conflict toward stock users, three of the variables (environmental attitudes, support for management actions, and perceived ecological impacts of stock) originally hypothesized to influence experienced conflict turned out non-significant. Thus, it appeared that perceived differences between hikers and stock users, importance of solitude, tolerance toward stock users, previous wilderness experience, and political orientation were the only significant predictors, explaining 54% of the variance in conflict experienced by hikers (Table 5-2, Model 1).

All other predictor variables, except political orientation and previous wilderness experience, were continuous and coded so that a significant positive correlation would be a sign of empirical support for the particular hypothesis tested. In the case of political orientation, a regression coefficient supporting the hypothesis would be negative because higher numbers reflected a more conservative person, who was hypothesized to be less in conflict with stock users. The level of previous wilderness experience was an indicator variable consisting of four categories (veterans, collectors, locals, beginners). Each indicator variable is compared to the base variable (veterans) which was left out of the model to allow for comparison. Thus, it appears that beginners are significantly less in conflict with stock users than the veterans whereas there are no significant differences in conflicts experienced by collectors and locals as compared to veterans.

The direction of the relationships was as hypothesized for all the other variables except political orientation. A hiker who (1) perceives hikers and stock users as being different, (2) values solitude, (3) is intolerant of stock users, (4) has a lot of wilderness experience, and (5) is conservative in his/her political attitudes is more likely to be in conflict with stock users than a hiker who scores low on each of these measures. It should be noted that perceived differences, importance of solitude, and tolerance for stock users were very stable predictors remaining significant no matter what other variables were in the model, and these three variables alone explained 53% of the variance. Therefore, the model of hikers' conflict toward stock users gives strongest support for the hypotheses related with these three variables. Previous wilderness
experience and political orientation had less significant coefficients which sometimes became insignificant when adding other variables to the model. Thus, findings in regard to these two variables provide less support for the hypotheses related to them.

The reversed relationship between political orientation variable and the dependent variable warrants further discussion as findings with regard to it were unexpected. At first it might appear illogical that while the simple correlation between political orientation and conflict with stock users is negative and nonsignificant \((r=-0.13, \text{Table 5-3})\), in the regression model it turns out to be significant and positive. To clarify this relationship, it was analyzed which variable caused the change in the direction of the relationship. It appeared that after the "support for management actions" had been controlled for, the relationship between political orientation and conflict with stock users was reversed and became significant. This indicates that at any given level of support for management actions, the more conservative people are, the more likely they are to be in conflict with stock users and vice versa. Therefore, even though the direction for the political attitude variable was not as predicted, it supports the hypothesis that conflicts may arise from society at large.

When analyzing simple correlations (Table 5-3), it appears that those variables which were significant in the regression model also had high simple correlations with the conflict variable (from 0.45 to 0.66), with the only exception being political orientation. However, the variables that were not significant in the regression model (perceived ecological impacts of stock use, support for management actions, and environmental attitudes) also had fairly high and significant simple correlations (from 0.21 to 0.46) with the dependent variable. The regression model suggests that, after having controlled for all the other significant variables, these three variables are insignificant. This reflects the fact that the role of these three variables as an explanation of conflict is already accounted for by the other variables in the model.

Four of the significant variables in the model for hikers were significant also in the model for conflict of those doing both toward stock users, and in the same direction (Table 5-2, Model 2). The only differences between the two models were
that (1) the perceived differences between hikers and stock users, which was a highly
significant variable in explaining hikers' conflict with stock users, did not predict
conflict of doing both toward stock users, and (2) support for management actions that
was not significant in the model for hikers appeared to be significant in the model for
doing both. Again, all the other relationships, except political orientation, were in the
direction predicted. To summarize the results, a person who has both traveled by foot
and with stock is more likely to be in conflict with stock users if s/he (1) values
solitude, (2) is intolerant of stock users, (3) has plenty of wilderness experience, (4)
supports protecting wilderness close to its natural state, and (5) is more conservative
in his/her political attitudes.

The differences between models 1 and 2 suggest that hikers and doing both differ
in their reasons for disliking stock users. It was logical that the perceived differences
variable was non-significant because people classified as doing both were asked
whether they perceived themselves to be different from themselves depending on their
mode of travel. The fact that support for the management actions variable became
more significant in the model 2 could be due to heterogeneity of the group having
both hiked and traveled with stock. Some of those people sampled as doing both were
likely to be primarily stock users and part of them primarily hikers. Stock users were
less likely to dislike stock users than hikers were, less environmentally-inclined, and
less supportive of restrictive management actions, while the trend for hikers was
reversed. Thus, having people that mostly hiked and people who mostly used stock in
the group doing both was likely to bring up that difference in the model. This was the
very reason why it was not justifiable to keep all the users (including stock users) in
the same model for predicting dislike toward stock users. In that kind of a model, the
differing attitudes between hikers and stock users would have seemed to explain each
groups' conflict toward stock users while, in fact, the most important factor in
explaining differences in degree of conflict might be the different nature of the two
conflicts. Stock users' conflict toward stock users is intra-activity conflict while
hikers' conflict with stock users is an interactivity phenomenon, and conflicts are
usually stronger between activities than within activities. Nevertheless, the attitude differences between these two groups are important to bear in mind. For example, they seem to give rise to hikers perceiving these two groups as different, which was found to significantly explain hikers' conflict with stock users.

**Conflict of Stock Users and Doing Both toward Hikers**

The models explaining stock users and doing both conflict toward hikers (Table 5-4, Models 3 and 4) were considerably less powerful — explaining 27% and 32% of variance of the conflict variable, respectively — and had fewer significant variables (four and three, respectively) than those developed to explain conflict toward stock users. Because the models of stock users' and doing boths' conflict toward hikers differed significantly only in regard to one variable (i.e., "Wilderness areas are primarily for recreational purposes"), they are analyzed together. When interpreting these models, the reader should recall that there were very few stock users (8%, n=9) and doing both (8%, n=9) in conflict with hikers altogether. Therefore, the models essentially predict the strength of enjoying meeting hikers rather than the strength of disliking meeting them, and this is the approach taken in reporting the results.

The three variables significant in the case of stock users and doing both, were in the direction predicted: (1) the more importance a person places on solitude, (2) the higher level of ecological impacts s/he perceives hikers have on the wilderness, and (3) the more s/he supports management actions designed to restrict human impacts on wilderness, the less likely s/he is to enjoy meeting hikers. Consequently, the level of previous wilderness experience, perceived compatibility of hikers and stock users, political orientation, perceived differences between hikers and stock users, and environmental attitudes were not significant in either one of the models. Thus, although perceived compatibility of hikers and stock users, perceived differences between hikers and stock users, and environmental attitudes had significant simple correlations in the case of the conflict of doing both toward hikers (Table 5-5), they were rendered insignificant when other variables were controlled.
Table 5-4. Multiple regression models of potential conflict variables for stock users and doing both on their conflict with hikers (Models 3 and 4).

<table>
<thead>
<tr>
<th></th>
<th>MODEL 3: STOCK USERS</th>
<th>MODEL 4: DOING BOTH</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>regression coefficients</td>
<td>p&lt;sub&gt;H&lt;/sub&gt;</td>
<td>regression coefficients</td>
<td>p&lt;sub&gt;p&lt;sup&gt;3&lt;/sup&gt;&lt;/sub&gt;</td>
</tr>
<tr>
<td>Importance of solitude</td>
<td>0.719</td>
<td>0.543</td>
<td>0.000&lt;sup&gt;5&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Perceived ecological impacts of hikers</td>
<td>0.189</td>
<td>0.303</td>
<td>0.0238</td>
<td></td>
</tr>
<tr>
<td>Support for management actions</td>
<td>0.177</td>
<td>0.413</td>
<td>0.0143</td>
<td></td>
</tr>
<tr>
<td>Wilderness areas are primarily for recreational purposes</td>
<td>0.384</td>
<td>0.0005</td>
<td>0.076</td>
<td>0.4876</td>
</tr>
<tr>
<td>Constant</td>
<td>-1.360</td>
<td>0.0803</td>
<td>-0.859</td>
<td>0.2738</td>
</tr>
<tr>
<td>Adjusted R-square</td>
<td>26.5%</td>
<td></td>
<td>32.2%</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>92</td>
<td></td>
<td>105</td>
<td></td>
</tr>
</tbody>
</table>

1 p-value for t for model 3 when the coefficients of the two models do differ significantly
2 p-value for t for model 4 when the coefficients of the two models do differ significantly
3 a combined p-value for t for both models when the coefficients of the two models do not differ significantly
4 p-value that indicates the significance of difference between the coefficients of the two models
5 H<sub>0</sub>: β<sub>1</sub>=0; H<sub>1</sub>=β<sub>1</sub>≠0

Table 5-5. Simple correlations between the continuous predictor variables and stock users' and doing boths' conflict with hikers.

<table>
<thead>
<tr>
<th></th>
<th>stock users</th>
<th>doing both</th>
</tr>
</thead>
<tbody>
<tr>
<td>Importance of solitude</td>
<td>0.36***</td>
<td>0.48***</td>
</tr>
<tr>
<td>Perceived ecological impacts of hikers</td>
<td>0.10</td>
<td>0.21*</td>
</tr>
<tr>
<td>Support for management actions</td>
<td>0.24**</td>
<td>0.45***</td>
</tr>
<tr>
<td>Wilderness areas are primarily for recreational purposes</td>
<td>0.22*</td>
<td>-0.12</td>
</tr>
<tr>
<td>Perceived compatibility of hikers and stock users</td>
<td>0.13</td>
<td>0.20*</td>
</tr>
<tr>
<td>Political orientation</td>
<td>0.07</td>
<td>-0.17</td>
</tr>
<tr>
<td>Perceived differences</td>
<td>-0.02</td>
<td>0.22*</td>
</tr>
<tr>
<td>Environmental attitudes</td>
<td>-0.00</td>
<td>0.43***</td>
</tr>
</tbody>
</table>

*** Significant at p<0.001, ** Significant at p<0.01, * Significant at p<0.05
The only difference between models for stock users and doing both was that those stock users who thought wilderness areas are primarily for recreational purposes were more in conflict with hikers than the ones who did not agree with the statement, while this variable was not significant in the case of doing both. To recall, this item was left off the scale "support for management actions" because of its very low (0.01) item-total correlation for stock users that would have dropped Cronbach alpha from 0.60 to 0.54. On the other hand, in the case of hikers and doing both there were modest item-total correlations (0.30, 0.18), arguably justifying the retention of the variable in the scale "support for management actions". Therefore, it did not come out significant as a separate factor in the regression model explaining the conflict of doing both toward hikers; it had probably been accounted for by the rest of the "support for management actions" scale. As the variable was important only in one model out of four, it is not highly significant, and it should be noted that there was no a priori hypothesis related to this variable. Post facto, the finding might suggest that those stock users who thought wilderness areas are primarily for recreational purposes, might value the wildernesses more highly as their recreation setting, thereby being more likely to be in conflict hikers.

The importance of solitude measure was again the most powerful predictor, accounting for 13% of the variance in the case of stock users and 23% of variance in the case of doing both. This further supports the hypothesis that different goals (in this case, people searching for solitude in wilderness) affect the level of conflict.

Conclusions

Because the strongest and most common conflict was expressed by hikers toward stock users, predicting that measure was of particular interest, and it turned out that the variables hypothesized predicted that conflict most accurately (54% of the variance explained). Due to the lack of variance in stock users' and doing boths' conflict with hikers, models 3 and 4 essentially predict the strength of enjoying meeting hikers rather than the strength of disliking meeting them (i.e., conflict).
Therefore, although the following discussion combines the findings of the four models presented above, in order to make a general review of the hypotheses, more value is placed on findings of the models predicting conflict of hikers and doing both toward stock users. Furthermore, it should be noted that because the setting in which conflict occurs affects the conflict dynamic (e.g., Watson et al., 1993), these results should not be directly generalized to other wilderness areas. Nevertheless, comparison of the results of the current study to previous research will provide some generalizability by reviewing which factors have been consistently found to be contributing to conflicts in recreational settings.

Based on the regression models, it can be concluded that somewhat different reasons underlie different conflicts (i.e., conflicts of hikers and doing both toward stock users, and stock users and doing both toward hikers). Furthermore, each of the hypotheses (p. 38), including those not empirically tested in earlier studies (i.e., H₇ and H₈), received some support.

Consistent with the findings of Watson et al. (1993), importance of solitude (a goal, H₄) was highly significant across all the conflicts, appearing to be the single most important variable. Support for management actions (a personal standard, H₂) received support from three models; it remained insignificant only in the model of hikers' conflict with stock users. Tolerance for other users (a personal standard, H₃) was strongly and consistently supported in the case of conflict with stock users (Models 1 and 2). Thus, the results support findings of the previous studies, suggesting that both goals (Driver & Bassett, 1975; Jackson & Wong, 1982; Ruddell, 1989; Ruddell & Gramann, 1991; Watson et al., 1993) and personal standards (Ruddell, 1989; Ruddell & Gramann, 1991; Ivy et al., 1992; Watson et al., 1993) can be important contributors to recreational conflicts. At the same time, the findings of the present study do not support Ruddell and Gramann's (1991) suggestion that standards might be more powerful explanatory variables than recreational goals; it appears that if the goals are operationalized specifically enough, they can be at least as powerful predictors as standards.
The level of specialization (H5), measured as previous wilderness experience, was supported by models 1 and 2; the most experienced hikers and people having both hiked and traveled with stock were more likely to be in conflict with stock users than the beginners. Thus, findings of Schreyer et al. (1984) and Watson et al. (1993) were further confirmed.

The hypothesis that recreational conflicts may have their origins in the society at large (H6, H7, H8) received some support, although not as strong as has been found in studies on conflicts between motorized and non-motorized recreation (Lucas, 1964; Knopp & Tyger, 1973; Jackson & Wong, 1982; Gladden, 1984; 1990; Pedersen, in press). Fundamental value differences (H8), operationalized as environmental attitudes, did not appear to be significant in any of the models after the more direct causes of conflicts had been controlled for; however, political orientation was somewhat significant in models 1 and 2 (although to the opposite direction than predicted). On the other hand, the variable measuring perceived differences between hikers and stock users (including not only wilderness-related differences but also perceived differences in environmental attitudes and lifestyles, H6, Table 4-11) was highly significant only in the model of hikers' conflict toward stock users. Beliefs about impacts of other users (H7) remained a significant explanatory variable in the case of conflict of stock users and doing both toward hikers (Models 3 and 4). Furthermore, beliefs about impacts of other users would have been significant in the case of hikers and doing both conflict toward stock users, had the tolerance variable -- which correlated with belief variable-- been left out.

The finding that the perceived differences variable was highly significant only in the case of hikers' conflict toward stock users warrants further discussion because, according to social psychological attraction theory (Newcomb, 1956), it should be significant in the case of stock users' conflict with hikers as well. The doing both group will be ignored in this discussion because --as mentioned earlier-- this group was asked to compare whether they think they are different from themselves depending on which way they travel. As mentioned at the outset of this chapter, the
conflict models toward hikers (Models 3 and 4) predict the strength of enjoying
meeting hikers rather than the strength of disliking meeting them (i.e., conflict). This
lack of negative feelings by stock users toward hikers might be the reason why
perceived differences did not explain stock users conflict toward hikers. There is no
previous study with which to compare this finding; for example, Watson et al. (1993)
developed models only for hikers' conflict toward stock users.
Management Implications of the Findings

At the outset of the thesis, it was argued that conflicts are not inherently good or bad; it is the way we deal with them that brings about positive or negative consequences. Central to constructive conflict management is the development of an understanding of not only the extent and level of conflict (recall the struggle spectrum, Keltner, 1990), but also the reasons for it. Consequently, the present discussion begins by analyzing what the findings on the extent and degree of the conflict imply for conflict management. It then proceeds to a discussion of the potential of managing the conflict based on the findings about the reasons for conflict. Because the conflict is largely asymmetric with almost half (42%) of the hikers who have met stock users disliking meeting them but only 8% of stock users negative toward hikers (Table 4-15), the discussion focuses on management options for that specific conflict. For theory development, it was important to test hypotheses regarding conflict between stock users and those doing both toward hikers, but because only eight percent of stock users and doing both reported themselves in conflict with hikers, the situation appears to require little management action at this time.

Extent and Level of Conflict

Keltner (1990) emphasizes that there are various kinds of conflicts ranging from very mild to violent ones (mild difference, disagreement, dispute, campaign, litigation, war), and that a conflict can evolve from one form to another. He further suggests that different stages of conflict require different management strategies. This is an important principle. In wilderness management, the principle of the "minimum tool rule" (Hendee, 1990, p. 188) parallels Keltner's continuum idea in suggesting that management should be situationally sensitive and involve only the minimum regulations or tools necessary to achieve the management objectives. Wilderness recreationists are looking for freedom and escape from rules and regulations of the
everyday life and "regulation itself can diminish the quality of the wilderness experience" (Hendee, 1990, p. 188).

Keltner's approach to conflict management is that of interpersonal communication and, as such, does not take into account a typical outdoor recreation conflict situation, that is often (1) asymmetric and (2) has resource managers involved as the third -- although not necessarily neutral-- party. For example, Keltner suggests that in mild disagreement, communication between the disagreeing parties suffices and no third party intervention is needed. In wilderness recreation, the situation is reversed; the Forest Service is necessarily present as the third party, and communication between the disagreeing parties may not be needed at the stage of a mild disagreement. It simply might suffice that the Forest Service better inform users about appropriate wilderness ethics and what to expect in the wilderness or, because of asymmetric nature of conflict, inform the parties of one another's concerns (or lack thereof). In other stages, communication facilitated by a third party becomes important (Keltner, 1990), which seems applicable to outdoor recreation conflicts as well. Instead of making managerial decisions on issues that people feel strongly about, the Forest Service could bring the involved parties together and facilitate the discussion to manage the conflict. The potential for this kind of public participation will be discussed later in this chapter.

Using the terminology suggested in Keltner's (1990) struggle spectrum, the current conflict in the Eagle Cap Wilderness is, on the average, at a stage of disagreement; most hikers do not yet advocate a complete ban on stock users, an indication that the disagreement had escalated to a dispute (excluding the other party), but the situation is more serious than mild difference because nearly one out of two hikers dislike meeting stock users. In disagreements, Keltner suggests mediation by a neutral third party as an effective conflict management tool. The role of a mediator or, alternatively, arranging a mediator if the Forest Service is not viewed as a neutral party by either one of the conflicting parties, would belong to the Forest Service. Moreover, as one goal of recreation management should be to prevent conflict
escalating into a problem requiring costly political and legal means of resolution (Hammitt, 1988), it is important that the Forest Service aggressively act now. In the following discussion, the potential of various management options—derived from the findings on causes of the conflict—is analyzed.

**Causes of Conflict**

Based on the results of the preceding analysis, it can be claimed that hikers' conflict toward stock users derives, at least in part, from fundamental value differences, a finding common in conflicts between motorized and nonmotorized recreationists (e.g., Lucas, 1964; Knopp & Tyger, 1973; Jackson & Wong, 1982; Gladden, 1984; 1990; Pedersen, in press). Furthermore, it seems that the conflict derives both from direct contact between hikers and stock users as well as from indirect contact. These indirect effects result from the attribution by hikers of undesirable effects of use (e.g., loss of vegetation at campsites) to stock users.

From the value and belief differences derives the lack of shared agreement over acceptable conditions and uses of the wilderness; stock users and hikers had significantly different opinions on almost every issue asked in this study (Chapter 4). Not surprisingly, the most distinct attitude differences emerged in regard to the acceptability of stock users in the wilderness (Table 4-12). As mentioned in the literature review regarding standards (Chapter 2), lack of shared agreement (norms) over acceptable social and resource conditions can fuel conflicts and has been found to underlie other recreational conflicts as well (e.g., Ruddell, 1989; Ivy et al., 1992).

Although underlying value conflicts cannot be solved, the specific disputes deriving from fundamental value differences can be resolved or at least relieved (Crowfoot & Wondolleck, 1990). Because of the underlying, inevitable value conflicts, resource managers must learn to live with the idea of ongoing conflict management and work to make the conflicts as productive as possible, or at least minimize their negative impacts (Coser, 1956; Deutsch, 1971; Dadrian, 1971; Devall, 1973). Among the possible positive consequences of conflicts, they can prevent
stagnation, thereby promoting personal and social change. They also provide an arena for airing problems, thereby building a basis for managing them (Deutsch, 1971). The following discussion provides ideas on how to capitalize on the positive aspects of outdoor recreational conflicts, arguing that public participation—which can potentially promote mutual learning-- might be the most productive way of managing the current conflict between hikers and stock users in the Eagle Cap Wilderness.

Deutsch (1971) argues that conflict should be institutionalized into the general management process. The Limits of Acceptable Change (LAC, Stankey et al., 1985) and other processes developed for recreation and wilderness planning and management, often combined with public participation, aim at doing this. Thus, it should be noted that although the whole LAC process can be run strictly as a technical planning process independent of the public, it becomes an effective conflict management tool promoting mutual learning only when it is combined with public participation.

Because the current conflict is only at a stage of disagreement, good potential exists for the parties to find a mutually satisfying solution through help of a third party, such as the Forest Service (Keltner, 1990). Thus, various techniques of public participation (e.g., workshops, advisory groups, field trips), either incorporated in the LAC process or separately, might be useful. Through such techniques, both hikers and stock users could learn about each other's values, thereby beginning to accept the legitimacy of each other's claims, a necessary step to constructive conflict management. By learning to know each other better, the tendency of hikers to stereotype stock users as different from themselves might change; it is easier to stereotype aliens (Michener et al., 1990). This kind of an open communication process would enhance trust building, thereby helping parties in coming up with an integrative solution to the problem. However, for the solution to be effective and for the parties to be motivated in working towards it, it is necessary that the Forest Service makes a commitment to implement any reasonable suggestions which the parties propose.
There are some specific factors that complicate the implementation of a public participation program for managing the current conflict. First, stock users currently have fairly unrestricted rights to use the whole wilderness while those hikers who dislike stock are advocating more restrictions on stock use. Therefore, stock users might feel that they have little to gain by participating in any management process designed to reduce conflict. Second, if stock users view this as a clearly competitive situation (competition over scarce resources), it makes application of collaborative conflict management strategies difficult (Deutsch, 1971). Consequently, it is crucial how the issue is framed. For example, people who view conflicts as something that can be solved, tend to adapt competitive strategies because their goal is to win the specific conflict (Pruitt & Rubin, 1986). A longer time perspective, together with a recognition that conflict cannot be completely solved, might change stock users' perception of the situation. Even though they might currently think that the issue does not warrant any action, or that they are politically strong enough to compete and therefore need not give up to any of the demands of the hikers, perceiving conflict as an on-going process would make them realize that it is to their advantage to collaborate. Similarly, knowledge that the Forest Service will impose its own solution if the parties appear unable to reach a mutual agreement might catalyze the process.

When bringing the conflicting parties together, an understanding of the causes of the conflict could be utilized to depersonalize the conflict by focusing on the issues instead of the people involved. The value of depersonalizing a conflict is in its potential for reducing the risk of uncontrolled conflict escalation (Pruitt & Rubin, 1986). Taking advantage of this potential would be especially important in managing conflict in the Eagle Cap Wilderness because inevitably some escalation will occur when the issue is brought up; by making stock users aware of the asymmetric conflict, an increasing number of stock users will become antagonistic toward hikers as well. A key step in this process would be to facilitate an understanding among all groups as to how their use of the wilderness might contribute to the perception of conflict with others. The lack of awareness that one's use interferes in some fashion with others can
thwart efforts to reduce conflict. For example, only about one-third of the stock users agree with the statement "Hikers dislike meeting stock users", and in order to be willing to grant standing to hikers, stock users must become more aware of the conflict. Helping stock users become more aware of the extent and causes of the conflict that hikers actually report would be one step in preventing further escalation.

The Recreation Opportunity Spectrum (ROS, Brown et al., 1979) can be a helpful conflict management tool in this situation because --as Daniels and Krannich (1990) point out-- ROS can relieve conflict by both spatial separation and by establishing more realistic expectations about the area. Spatial separation might include either separate trails or areas for hikers and stock users in parts of the wilderness. In terms of expectations, hikers could be better informed of the level of stock use in the wilderness. Those hikers having realistic expectations regarding the amount of stock use in the area, may accept actual stock use more easily than those who expect to find very little or no stock use in the area. On the other hand, ROS can intensify the conflict in the case somebody violates the officially accepted rules that have created more specific expectations. For example, if a hiker encounters signs that s/he attributes to stock use within an area that s/he knows to be assigned for foot-travel only, his/her conflict with stock users might be stronger than if s/he held only personal standards of disapproving stock use.

Spatial separation was the most common management suggestion by hikers reported bothered by stock user (Table 4-25), and support for closing at least some areas to stock use was a significant variable in explaining hikers' conflict with stock users (Table 5-2). In addition, some stock users and persons having travelled both by foot and with stock suggested separate areas and/or trails for stock users and hikers. This indicates that although most stock users and doing both oppose closing parts of the Eagle Cap Wilderness to stock use (Table 4-12), there might be potential for mutual agreement if each group acknowledges the legitimacy of each other's claims.

Spatial separation of hikers and stock users is likely to be a successful solution only in cases where hikers are concerned about stock users' impacts (whether
ecological or social) on their hiking experience. On the other hand, the spatial separation of hikers and stock users will do little to reduce conflict if that conflict derives from a perception that stock use in general is an inappropriate use of wilderness, irrespective of whether hikers see the impacts. The latter is a more complex conflict situation to manage, but many hikers appear to feel that way. For example, almost half (44%) of hikers who dislike meeting stock users agree that wilderness areas are not primarily for recreational purposes, and one-third think that "Parts of the Eagle Cap Wilderness should be closed to all recreational use".

Other management options commonly suggested by hikers were limiting numbers of stock and stock users, education, and stricter rules and their enforcement. Restricting numbers of stock users would likely reduce the level of encounters with stock users, thereby alleviating conflict. However, numerous studies have indicated that reducing numbers of users is not an efficient way of reducing ecological impacts (Cole, 1990).

Education could work in two ways to alleviate the conflict. First, the Forest Service could educate hikers about the historical role of stock as a way of travel in the wilderness and the reasons for stock users having the right of way (e.g., stock users cause less environmental impact if they stay on the trail). Second, stock users could be taught the use of minimum impact camping techniques. Those hikers who dislike stock users because of their impact on nature, would probably feel less antagonistic toward stock if they knew that stock users strive for minimizing their impacts (Watson et al., 1993, pp. 32-34), thereby alleviating the indirect conflict. However, that would not help for those hikers who think stock necessarily has too high an impact on nature (recall the quote on p. 1 and the discussion on self-reported reasons of conflict).

The "minimum tool rule" should guide application of rules and regulations in wilderness. Spatial separation of hikers and stock users and/or restricting numbers of stock users are among the most restrictive management actions and, therefore, it would be important for managers to consider education and persuasion before implementing anything more restrictive. However, there is a trade-off between using
a "minimum tool" and preventing unnecessary conflict escalation; if the minimum tool appears to be inefficient, the conflict might have escalated by the time more stringent management actions are implemented. Because there are different degrees of conflict in the Eagle Cap, ranging from mild difference (those hikers who slightly dislike stock users) to dispute (those hikers who strongly dislike stock users and feel the wilderness should be a place with no horses allowed), a combination of management actions might provide the best result by reducing the antipathy of hikers toward stock users without escalating the conflict of stock users toward hikers more than necessary. For example, simultaneously with an initiation of a public participation program, the Forest Service could start an education program targeted both to hikers (e.g., how to meet stock on the trails, why stock has the right-of-way) and stock users (e.g., minimum impact techniques). The education program might suffice in alleviating conflict for those hikers who slightly dislike stock use in the Eagle Cap Wilderness, while those more strongly in conflict with stock users might be willing to invest their time in a public participation program to help in managing the conflict.

**Management Principles**

Conflict management is complex; there seldom is one right way of dealing with any specific conflict. However, the preceding discussion --based on the literature review and the case study-- identifies several principles (i.e., fundamental assumptions) of conflict management useful in outdoor recreation. The purpose of these principles is to help recreation managers to cope with conflicts both on a day-to-day basis and in writing long-term guidelines for management. The following provides a summary of the principles emerging from the current study.

1) **While conflicts are inevitable and irresolvable, specific disputes are amenable to resolution.** Given the diversity of people participating in outdoor recreation, there are inevitably fundamental value differences among the users. As people rarely change their deeply held values, the underlying value conflicts cannot be solved, and as such "conflict resolution" is a misconception. Instead, recreation managers should
learn to live with the idea of ongoing conflict management. Although underlying value conflicts cannot be solved, the specific disputes deriving from fundamental value differences can be resolved or at least relieved.

2) **Conflicts are not inherently good or bad.** It is the way we deal with them that bring about their negative (e.g., violence) and/or positive consequences (e.g., social change), and framing of the issues is central in aiming at positive outcomes. For example, if the parties perceive the conflict as a highly competitive win-lose situation, it might create a self-fulfilling prophecy and thereby, a win-lose outcome. On the other hand, successful collaboration can yield outcomes where both parties feel winners.

3) **Conflicts form a continuum and each conflict stage warrants a different kind of management action.** One conflict can evolve through various stages, either escalating (e.g., from mild difference to disagreement) or de-escalating (e.g., from litigation to dispute). Because different conflict stages require different management actions, it is important to analyze at which stage any specific conflict is before attempting to manage it.

4) **Conflict management should be guided with the minimum tool rule.** Managers should utilize the least restrictive action that will accomplish the goal. The understanding of the stage (item 3) as well as origins (item 5) of the conflict helps in determining the appropriate action.

5) **Conflicts have multiple origins,** affecting their level, extent, and dynamics. Therefore, an understanding of the causes of conflicts can help managers in choosing appropriate, efficient conflict management techniques.

6) **Conflict escalation may be necessary** for its effective management under certain circumstances, but managers should try to control escalation. The understanding of the causes of conflict (both direct and indirect) can be utilized to control for its escalation. On the other hand, there is a trade-off between using a "minimum tool" and preventing unnecessary conflict escalation; if the minimum tool appears to be
inefficient, the conflict might have escalated by the time more stringent management actions get to be implemented.

7) Management of conflicts should be proactive, integrated into overall planning process, rather than reactive, activated only when a crisis has already evolved. This can be implemented through recreation planning processes such as LAC (Limits of Acceptable Change), combined with public participation. Although proactive planning reduces the likelihood of an unexpected conflict, one might still evolve. Then, reactive planning is needed, geared toward resolving or at least relieving the specific dispute.

**Implications for Research**

The study findings provide some support for all the hypotheses. Consequently, the model developed based on previous theoretical and empirical studies (Figure 2-1) does not need any revisions based on the data, and can be used as a theoretical framework when researchers and/or managers design studies on causes of conflicts in other recreational settings. The findings suggest that different reasons underlie different conflicts so that not all the reasons included in the model are significant in all the situations. Thus, the value of the model is in providing a conceptual framework that can help researchers and managers in trying to sort out the possible causes for any given conflict; it can be used both at a conceptual level as well as in further design of empirical studies.

From a theoretical perspective, the next step in testing the model would be to include mode of experience and resource specificity measures into it, as they were not tested in the current study. At the same time, the operationalization of concepts included in the study (i.e., goals, standards, level of specialization, values, and beliefs) should be adjusted to the situation and types of recreationists involved. A specifically suitable statistical method for testing the full model could be path analysis. For example, the current study found that environmental attitudes were rendered insignificant once other variables were controlled. However, it could be that
environmental attitudes function as a latent variable affecting those variables that were significant in the model; for example, the environmental attitude variable modestly correlated with tolerance \((r=0.43)\) and perceived ecological impacts of stock \((r=0.40)\). Therefore, the path analysis approach might enhance the model's predictive power.

Apart from adjusting the operationalization of explanatory variables to the specific situation, conflict measures could be further developed. This study clearly pointed out that conflict is a continuum with individual's experiencing different levels of conflict, and that different levels of conflict warrant different management actions. Consequently, in further developing operationalization of the conflict concept, it is important to retain sufficient variation in the explanatory variable. Especially important would be to further develop conflict questions that form a scale that would increase variance and reliability of the dependent variable (Nunnally, 1967; O'Brien, 1981a; 1981b). The current study combined four questions in the case of hikers conflict with stock users and two questions in the case of stock users conflict toward hikers (like/dislike measure, Tables 4-15 through 4-17), but could not combine the "having been bothered by hikers/stock users" measure (Tables 4-21 and 4-22) with them.

The principles that emerged from the current study could be further developed into more detailed guidelines for managing outdoor recreation conflicts. Essentially, all successful management actions tend to reduce conflicts by creating more favorable resource and social conditions, and it is important to remember that conflict management should be an integral part of other recreation management. Thus, the value of guidelines developed from a perspective of conflict management would be in integrating conflict management --one of the central tasks of recreation managers (Jakes et al., 1990; Schreyer, 1990)-- with other important management issues (e.g., maintaining the conditions mandated by law).

Finally, the current study took a new approach in classifying wilderness users based on their mode of travel in general in the Eagle Cap Wilderness, arguing that it is more descriptive of the users than classifying people on the basis of how they
travelled on the most recent trip. The new group, "doing both", is an interesting
research topic by itself and this group has not been studied before because wilderness
surveys have typically focused on the latest trip the person has finished. There are
several questions related to the "doing both" group, for example: (1) is this a life cycle
phenomenon; when children are small it is easier to travel with stock, and when one
gets older, stock enables enthusiasts to continue to experience the wilderness; (2) are
there people who have switched away from stock use because they perceive stock use
has too strong impacts on the wilderness; and (3) how common is it that users vary
their mode of travel between different wildernesses; in the present study, some people
commented that they hike in other wildernesses, but in the Eagle Cap they almost
always use stock. The last one could be a function of such factors as resource
characteristics, perceived capacity of area to handle stock, and different conceptions
of appropriateness in different areas. One way of approaching the issue could be to do
life histories in an ethnographic manner.

Depending on what kind of life histories visitors have in regard to their wilderness
travel mode, different conflict patterns might emerge. For example, the broader
experience of "doing both" might socialize individuals, leading them to be more
tolerant of both hikers and stock users. On the other hand, this broader experience
could accentuate conflict as well; if a person has shifted from stock use to hiking
because s/he perceives stock use has excessive impacts on the wilderness, s/he might
be even more negative toward stock users than those who have never travelled with
stock. Although the present study suggests that the former, alleviating effect, might
be the more common case --the "doing both" group was significantly less in conflict
with stock users (13%) than hikers were (42%)-- the issue warrants further research.
Due to potentially very different reasons for having travelled both with stock and by
foot (see discussion in previous paragraph), different conflict mechanisms might
affect different visitors.


Driver, B. L. 1977. Item pool for scales designed to quantify the psychological outcomes desired and expected from recreation participation. Available from: USDA Forest Service Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colorado.


Little, W., & Noe, F. P. 1984. A highly condensed description of the thought process used in developing visitor research for southeast parks. Atlanta, Georgia: USD1, National Park Service Southeast Regional Office.


Appendix A: Trailheads of the Eagle Cap Wilderness

TRAILHEADS INCLUDED IN THE ON-SITE SURVEY:

TP = Two Pan
HC = Hurricane Creek
HL = Head of Lake
IX = Indian Crossing
CC = Cornucopia
EE = East Eagle
ME = Main Eagle
NC = North Fork of Catherine Creek
MS = Moss Springs
RS = Rock Springs

O = OTHER TRAILHEADS
## Appendix B: Sampling Frame

<table>
<thead>
<tr>
<th>JULY</th>
<th>TP</th>
<th>HL</th>
<th>HC</th>
<th>IX</th>
<th>CC</th>
<th>EE</th>
<th>ME</th>
<th>NC</th>
<th>MS</th>
<th>RS</th>
</tr>
</thead>
<tbody>
<tr>
<td>17 (Sa)</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 (Su)</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>19 (Mo)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 (Tu)</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21 (Wd)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22 (Tr)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23 (Fr)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>24 (Sa)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>25 (Su)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AUGUST</th>
<th>TP</th>
<th>HL</th>
<th>HC</th>
<th>IX</th>
<th>CC</th>
<th>EE</th>
<th>ME</th>
<th>NC</th>
<th>MS</th>
<th>RS</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 (Sa)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>8 (Su)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>9 (Mo)</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 (Tu)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 (Wd)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>12 (Tr)</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13 (Fr)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>14 (Sa)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>15 (Su)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SEPTEMBER</th>
<th>TP</th>
<th>HL</th>
<th>HC</th>
<th>IX</th>
<th>CC</th>
<th>EE</th>
<th>ME</th>
<th>NC</th>
<th>MS</th>
<th>RS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 (Sa)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 (Su)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>6 (Mo)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 (Tu)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>8 (Wd)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>9 (Tr)</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>10 (Fr)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 (Sa)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 (Su)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

# of times each trailhead was sampled:

| 5 | 5 | 5 | 4 | 4 | 4 | 5 | 5 | 4 | 4 |

**ABBREVIATIONS:**
- TP=Two Pan, HL=Head of Lake, HC=Hurricane Creek, IX=Indian Crossing, CC=Cornucopia,
- EE=East Eagle, ME=Main Eagle, NC=North Fork of Catherine, MS=Moss Springs, RS=Rock Springs
Appendix C: Survey Instrument and Aggregate Answers

The questionnaire was administered in an 8-page, 7 x 8½-inch staple-bound booklet, with a cover printed on green paper identifying it as "The Eagle Cap Wilderness Visitor Study". In this appendix, the questions are as in the original survey instrument, and the aggregate answer distributions are given when feasible. Because llama users (N=14) and outfitters (N=5) were not used in further analyses, they were excluded also from the aggregate results except in survey question number 6. The total sample size after this modification is 766.

Inside the cover was the following text:

The Eagle Cap Wilderness is a special and unique part of Oregon. In order to better understand the attitudes and preferences of users like you, researchers at Oregon State University are asking visitors to complete this questionnaire.

Your participation in this project is completely voluntary. However, if you choose to participate, we encourage you to try to answer all the questions. A missing answer can decrease the value of your response.

Please answer these questions by yourself and save the discussion with others until you have completed and returned the questionnaire. Try to give answers that you believe to be true. Take as much time as you need to consider your answers. There are no right or wrong answers; the best response is the one which most closely reflects your personal feelings and beliefs.

Your answers will be completely confidential and not connected with you.

If you would like more information about this research project, please contact me at the following address:

Liisa Kajala
Department of Forest Resources
Oregon State University
Peavy Hall A 108
Corvallis, OR 97331-5703

Thank you for your cooperation.
First, we would like to ask some general questions about your past visits to the Eagle Cap Wilderness. If this was your first trip, answer these questions on the basis of this trip only.

1. How many times have you visited the Eagle Cap Wilderness, including this trip? About ___ times. (N=765)

<table>
<thead>
<tr>
<th>Time(s)</th>
<th>Percentage, %</th>
<th>Times</th>
<th>Percentage, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>36</td>
<td>6-10</td>
<td>11</td>
</tr>
<tr>
<td>2</td>
<td>13</td>
<td>11-20</td>
<td>10</td>
</tr>
<tr>
<td>3-5</td>
<td>18</td>
<td>over 20</td>
<td>13</td>
</tr>
</tbody>
</table>

2. Which of the following best describes the length of your visits to the Eagle Cap Wilderness? (N=763)
   [13%] I usually stay only a few hours.
   [16%] I usually stay a full day.
   [33%] I usually stay one or two nights.
   [19%] I usually stay more than two nights.

3. How many people are usually in your group when you visit the Eagle Cap Wilderness (including yourself)?
   [36%] 1-2
   [50%] 3-6
   [14%] More than six. (N=765)

4. Have you ever taken a dog with you when visiting the Eagle Cap Wilderness?
   [33%] Yes
   [67%] No (N=763)

5. With whom have you visited the Eagle Cap Wilderness? (Check as many as apply. If you check more than one, please circle the one that is most typical of your trips.) (N=766 people, 1254 marks)
   [66%] Friends
   [71%] Family
   [8%] I usually travel alone.
   [9%] Organized club (specify) church, scouts, 4-H, mountaineering clubs, riding clubs
   [8%] School group
   [2%] Other (specify) hunters, fishermen, co-workers

6. In what ways have you traveled in the Eagle Cap Wilderness? (Check as many as apply. If you check more than one, please circle the one that is most typical of your trips.) (N=785 people, 1010 marks)
   [84%] Hiking, carrying my equipment myself.
   [10%] Hiking, leading horses, mules, or burros.
   [2%] Hiking, leading llamas.
   [3%] Riding on horses provided by an outfitter; dropped off to camp.
   [3%] Riding on horses provided by an outfitter, with the outfitter remaining with my group.
   [26%] Riding on privately owned horses or mules.
   [2%] Other (please specify) skiing, outfitting himself/herself

7. People have many reasons for visiting wilderness areas. Please tell us the three most important reasons why you visit the Eagle Cap Wilderness.
We would like some information about your wilderness experiences in general.

8. How many different designated wildernesses in the U.S. have you visited in your lifetime?
   About ___ wildernesses.
   # of wildernesses percentage, % (N=758)
   
   1-2  16
   3-4  25
   5-6  20
   7-8  5
   9-10 14
   11-20 14
   over 20  6

9. Since your first wilderness visit, about how often have you gone on additional wilderness trips? (N= 750)
   [15%] Less than once every two years.
   [13%] About once every two years.
   [25%] About once every year.
   [34%] Two to five times per year.
   [ 6%] Six to ten times per year.
   [ 7%] Over ten times per year.

10. In the following section, we would like you to tell us how much you agree or disagree with a series of statements about wilderness use and users. (Circle one, or mark no opinion)

   Please note: Stock user in this questionnaire means a recreationist either riding or leading a horse or a mule.

<table>
<thead>
<tr>
<th>strongly agree</th>
<th>disagree</th>
<th>neutral</th>
<th>strongly disagree</th>
<th>neutral</th>
<th>disagree</th>
<th>agree</th>
<th>no opinion</th>
</tr>
</thead>
</table>
   It doesn't matter to me if there are hiking groups camped within sight or sound of my camp. (N=746) 13% 33% 26% 21% 4% 3%
   If recreation use threatens the ecological conditions of the Eagle Cap Wilderness, recreation use should be restricted. (N=748) 9 12 8 37 33 1
   Hikers and stock users have similar attitudes about environmental issues. (N=748) 13 33 15 24 5 10
   Stock users tend to dislike meeting hikers in wilderness areas. (N=747) 10 34 25 10 2 19
   Fish stocking with non-native fish is appropriate in wilderness areas. (N=752) 21 28 19 19 6 9
<table>
<thead>
<tr>
<th>Statement</th>
<th>strongly disagree</th>
<th>disagree</th>
<th>neutral</th>
<th>agree</th>
<th>strongly no opinion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parts of the Eagle Cap Wilderness should be closed to all recreational use. (N=746)</td>
<td>30</td>
<td>29</td>
<td>12</td>
<td>16</td>
<td>7</td>
</tr>
<tr>
<td>It doesn't matter to me if there are stock groups camped within sight or sound of my camp. (N=750)</td>
<td>25</td>
<td>31</td>
<td>18</td>
<td>20</td>
<td>4</td>
</tr>
<tr>
<td>It's most enjoyable when you don't see anyone else in wilderness except your own group. (N=751)</td>
<td>4</td>
<td>21</td>
<td>21</td>
<td>31</td>
<td>23</td>
</tr>
<tr>
<td>Stock use and hiking are compatible with each other in wilderness areas. (N=748)</td>
<td>7</td>
<td>16</td>
<td>16</td>
<td>45</td>
<td>11</td>
</tr>
<tr>
<td>Stock users and hikers hold similar values toward wilderness areas. (N=746)</td>
<td>8</td>
<td>27</td>
<td>17</td>
<td>32</td>
<td>6</td>
</tr>
<tr>
<td>Hikers prefer not to camp where stock users have camped before. (N=748)</td>
<td>2</td>
<td>11</td>
<td>16</td>
<td>41</td>
<td>20</td>
</tr>
<tr>
<td>Hikers tend to dislike meeting stock users in wilderness areas. (N=748)</td>
<td>3</td>
<td>23</td>
<td>24</td>
<td>31</td>
<td>9</td>
</tr>
<tr>
<td>Hikers and stock users have different lifestyles. (N=743)</td>
<td>4</td>
<td>15</td>
<td>19</td>
<td>40</td>
<td>7</td>
</tr>
<tr>
<td>Parts of the Eagle Cap Wilderness should be closed to stock but open to hiking. (N=753)</td>
<td>18</td>
<td>15</td>
<td>10</td>
<td>30</td>
<td>22</td>
</tr>
<tr>
<td>Wilderness areas are primarily for recreational purposes. (N=752)</td>
<td>11</td>
<td>25</td>
<td>11</td>
<td>38</td>
<td>13</td>
</tr>
<tr>
<td>Stock users and hikers come to wilderness for different reasons. (N=749)</td>
<td>7</td>
<td>32</td>
<td>20</td>
<td>28</td>
<td>4</td>
</tr>
<tr>
<td>Recreational use of the Eagle Cap Wilderness should be restricted in crowded areas if the opportunities for solitude are lost. (N=747)</td>
<td>7</td>
<td>18</td>
<td>16</td>
<td>42</td>
<td>14</td>
</tr>
<tr>
<td>The Eagle Cap Wilderness should provide more facilities for stock use. (N=749)</td>
<td>19</td>
<td>29</td>
<td>26</td>
<td>11</td>
<td>5</td>
</tr>
</tbody>
</table>
The Eagle Cap Wilderness should be a place with no horses allowed.  
(N=761)  

<table>
<thead>
<tr>
<th>strongly disagree</th>
<th>disagree</th>
<th>neutral</th>
<th>agree</th>
<th>strongly agree</th>
<th>no opinion</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
<td>37</td>
<td>16</td>
<td>7</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

Commercial livestock grazing (sheep, cattle) should continue to be allowed as appropriate use of wilderness areas.  
(N=759)  

<table>
<thead>
<tr>
<th>strongly disagree</th>
<th>disagree</th>
<th>neutral</th>
<th>agree</th>
<th>strongly agree</th>
<th>no opinion</th>
</tr>
</thead>
<tbody>
<tr>
<td>30</td>
<td>21</td>
<td>14</td>
<td>23</td>
<td>9</td>
<td>4</td>
</tr>
</tbody>
</table>

The following questions ask you to evaluate the effects other visitors have on your wilderness experiences in the Eagle Cap Wilderness.

11. Please tell us how you feel about meeting other visitors in the Eagle Cap Wilderness by marking one response for each type of user.  
(N=766)  

<table>
<thead>
<tr>
<th>visitors in the Eagle Cap Wilderness</th>
<th>dislike meeting them</th>
<th>neither meeting nor like them</th>
<th>enjoy meeting them</th>
<th>never meeting this type of group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hikers-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>day visitors</td>
<td>1%</td>
<td>1%</td>
<td>4%</td>
<td>37%</td>
</tr>
<tr>
<td>overnight visitors</td>
<td>2</td>
<td>1</td>
<td>4</td>
<td>33</td>
</tr>
<tr>
<td>Horseback riders-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>day visitors</td>
<td>8</td>
<td>7</td>
<td>13</td>
<td>31</td>
</tr>
<tr>
<td>overnight visitors</td>
<td>9</td>
<td>7</td>
<td>12</td>
<td>30</td>
</tr>
<tr>
<td>Hikers leading horses or mules-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>day visitors</td>
<td>6</td>
<td>7</td>
<td>11</td>
<td>32</td>
</tr>
<tr>
<td>overnight visitors</td>
<td>6</td>
<td>7</td>
<td>11</td>
<td>31</td>
</tr>
<tr>
<td>Groups with llamas-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>day visitors</td>
<td>8</td>
<td>6</td>
<td>9</td>
<td>28</td>
</tr>
<tr>
<td>overnight visitors</td>
<td>8</td>
<td>6</td>
<td>9</td>
<td>27</td>
</tr>
<tr>
<td>Groups with dogs</td>
<td>13</td>
<td>7</td>
<td>11</td>
<td>31</td>
</tr>
<tr>
<td>Hunters</td>
<td>21</td>
<td>8</td>
<td>11</td>
<td>23</td>
</tr>
<tr>
<td>Fishermen</td>
<td>3</td>
<td>2</td>
<td>5</td>
<td>34</td>
</tr>
<tr>
<td>Groups with commercial outfitters</td>
<td>13</td>
<td>8</td>
<td>13</td>
<td>30</td>
</tr>
</tbody>
</table>

12. Are there any places or times you try to avoid in the Eagle Cap Wilderness because of the number of people visiting that area?  
(N=732)  

[73%] No.  
[27%] Yes. Please list these places and/or times.  

13. Please think about the hikers in the Eagle Cap Wilderness. When visiting the Eagle Cap Wilderness:

a) Have you ever been bothered by the number of hikers?
not at all [61%] very little [28%] somewhat [9%] a lot [2%]
If yes, please explain.

b) Have you ever been bothered by particular types of hikers?
not at all [64%] very little [23%] somewhat [11%] a lot [3%]
If yes, please explain.

c) Have you ever been bothered by the behavior of hikers?
not at all [57%] very little [26%] somewhat [14%] a lot [4%]
If yes, please explain.

14. Please think about the stock users in the Eagle Cap Wilderness. When visiting the Eagle Cap Wilderness:

a) Have you ever been bothered by the number of stock users?
not at all [52%] very little [21%] somewhat [19%] a lot [9%]
If yes, please explain.

b) Have you ever been bothered by particular types of stock users?
not at all [60%] very little [21%] somewhat [14%] a lot [5%]
If yes, please explain.

c) Have you ever been bothered by the behavior of stock users?
not at all [60%] very little [23%] somewhat [13%] a lot [4%]
If yes, please explain.
15. In light of your answers to questions 13 and 14, what (if anything) would you suggest should be done about the situation?

---

16. Please evaluate the impact you think an individual from each of the following user groups has on the ecological conditions of the Eagle Cap Wilderness.

<table>
<thead>
<tr>
<th></th>
<th>no impact at all</th>
<th>serious impacts</th>
<th>I don't know</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Hiker-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hiker leading horses or mules-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hiker with llamas-</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Person with dog</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hunter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Angler</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Person traveling with commercial outfitter</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- Hiker-
  - day visitor
  - overnight visitor
- Horseback rider-
  - day visitor
  - overnight visitor
- Hiker leading horses or mules-
  - day visitor
  - overnight visitor
- Hiker with llamas-
  - day visitor
  - overnight visitor
- Person with dog
- Hunter
- Angler
- Person traveling with commercial outfitter
17. Now we would like to know whether you agree or disagree with the following value statements. (Circle one, or mark no opinion)

<table>
<thead>
<tr>
<th>Statement</th>
<th>strongly disagree</th>
<th>disagree</th>
<th>neutral agree</th>
<th>strongly agree</th>
<th>no opinion</th>
</tr>
</thead>
<tbody>
<tr>
<td>More wilderness areas should be established in the U.S. (N=756)</td>
<td>9</td>
<td>8</td>
<td>14</td>
<td>29</td>
<td>39</td>
</tr>
<tr>
<td>Humans must live in harmony with nature in order to survive. (N=756)</td>
<td>1</td>
<td>3</td>
<td>6</td>
<td>37</td>
<td>52</td>
</tr>
<tr>
<td>Plants and animals exist primarily for human use. (N=749)</td>
<td>28</td>
<td>34</td>
<td>15</td>
<td>15</td>
<td>6</td>
</tr>
<tr>
<td>The earth should have far fewer people on it. (N=744)</td>
<td>8</td>
<td>11</td>
<td>27</td>
<td>24</td>
<td>25</td>
</tr>
<tr>
<td>Wildlife, plants, and humans have equal rights to live and develop on the earth. (N=749)</td>
<td>10</td>
<td>16</td>
<td>12</td>
<td>36</td>
<td>25</td>
</tr>
<tr>
<td>We must be prepared to sacrifice environmental quality for economic growth. (N=752)</td>
<td>36</td>
<td>36</td>
<td>13</td>
<td>10</td>
<td>3</td>
</tr>
<tr>
<td>The balance of nature is very delicate and easily upset. (N=754)</td>
<td>3</td>
<td>13</td>
<td>11</td>
<td>37</td>
<td>34</td>
</tr>
<tr>
<td>We should actively harvest more timber to meet the needs of a much larger human population. (N=754)</td>
<td>40</td>
<td>29</td>
<td>15</td>
<td>11</td>
<td>4</td>
</tr>
<tr>
<td>Forests have a right to exist for their own sake, regardless of human concerns and uses. (N=751)</td>
<td>7</td>
<td>15</td>
<td>15</td>
<td>31</td>
<td>30</td>
</tr>
<tr>
<td>Forests outside wilderness should be used primarily for timber and wood products. (N=755)</td>
<td>19</td>
<td>34</td>
<td>21</td>
<td>18</td>
<td>5</td>
</tr>
<tr>
<td>The environmental laws and regulations currently on the books have gone too far already. (N=749)</td>
<td>27</td>
<td>19</td>
<td>18</td>
<td>18</td>
<td>14</td>
</tr>
</tbody>
</table>
In conclusion, we would like to ask some questions about you.

18. What is your age? ____ years.

<table>
<thead>
<tr>
<th>age group</th>
<th>frequency, % (N=764)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16-20</td>
<td>12</td>
</tr>
<tr>
<td>21-30</td>
<td>17</td>
</tr>
<tr>
<td>31-40</td>
<td>26</td>
</tr>
<tr>
<td>41-50</td>
<td>29</td>
</tr>
<tr>
<td>51-60</td>
<td>9</td>
</tr>
<tr>
<td>over 61</td>
<td>7</td>
</tr>
</tbody>
</table>

19. Are you [41%] Female [59%] Male.

20. What is the highest level of education you have attained? (Mark one.) (N=757)

- Elementary school: [0%]
- Some high school: [4%]
- High school graduate: [14%]
- Some college: [26%]
- Bachelor's or equivalent: [28%]
- Master's or equivalent: [15%]
- Advanced degree (M.D., Ph.D., etc.): [11%]

21. Please check the category that represents your total household income before taxes. (N=704)

- [24%] less than $25,000
- [25%] $25,000 - $39,999
- [17%] $40,000 - $54,999
- [15%] $55,000 - $69,999
- [7%] $70,000 - $84,999
- [13%] over $85,000

22. What is your zip code? ______________________

23. In what size community do you now live? (N=764)

- On a farm or in a rural area: [17%]
- Small town (under 1,000 population): [6%]
- Town (1,000 - 5,000 population): [12%]
- Small city (5,000 - 50,000 population): [34%]
- Medium city (50,000 - 1 million population): [20%]
- In a major city or metropolitan area (over million people): [10%]

24. Where did you live most of the time when you were growing up? (N=761)

- On a farm or in a rural area: [24%]
- Small town (under 1,000 population): [9%]
- Town (1,000 - 5,000 population): [13%]
- Small city (5,000 - 50,000 population): [27%]
- Medium city (50,000 - 1 million population): [9%]
- In a major city or metropolitan area (over million people): [19%]

25. On domestic policy issues, would you consider yourself to be:

- very liberal 1----2----3----4----5----6----7 very conservative
- 6% 16% 13% 35% 14% 10% 6%

26. Are you currently a member of an outdoor or conservation organization? (N=764)

- No. [72%]
- Yes. Please specify ______________________

27. What is your age group?

- 16-20: 12
- 21-30: 17
- 31-40: 26
- 41-50: 29
- 51-60: 9
- over 61: 7

28. What is your highest level of education?

- Elementary school: [0%]
- Some high school: [5%]
- High school graduate: [14%]
- Some college: [26%]
- Bachelor's or equivalent: [28%]
- Master's or equivalent: [15%]
- Advanced degree (M.D., Ph.D., etc.): [11%]