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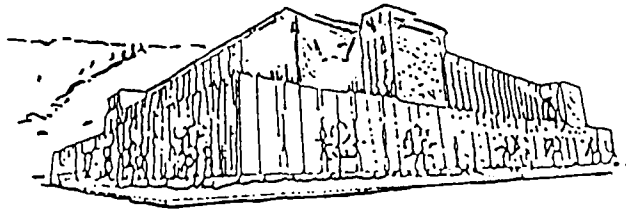
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RELATIONSHIP OF BENEFITS SOUGHT TO PREFERRED SETTING ATTRIBUTES
FOR TWO GROUPS OF SNOWMOBILE USERS

By:

Eric G. Schultz

B.S., University of Oregon, 1992

Presented in Partial Fulfillment


of the Requirements for the Degree of

Master of Science

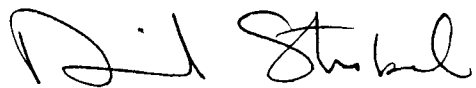
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Relationship of Benefits Sought to Preferred Setting Attributes for Two Groups of Snowmobile Users

Director: Stephen F. McCool 

This paper explores the assumptions underlying benefit and experience based management of outdoor recreation areas. In order to test these assumptions, snowmobile users in Yellowstone National Park and the Beaverhead National Forest were segmented with the use of Recreation Experience Preference Scales (REP). The people in each benefit segment were then tested for differences in their preferred site attributes. Respondents from each study location were also tested for differences in desired experiences and preferred settings. This portion of the analysis was concerned with providing managers the necessary information to maintain a desirable range of experience opportunities throughout the Yellowstone Region. This study identified three groups with different experience preferences and found differences in group membership between study areas. Results failed to identify a statistical relationship between experience clusters and preferred site attributes. Suggestions for future research and potential management implications in the Yellowstone Region are discussed.

TABLE OF CONTENTS

	<u>Page</u>
ACKNOWLEDGEMENTS	i
ABSTRACT	ii
LIST OF TABLES AND FIGURES	iii
CHAPTER 1	
INTRODUCTION	1
Problem Definition	1
Problem Statement	3
Objectives	5
CHAPTER 2	
CONCEPTUAL FRAMEWORK AND LITERATURE REVIEW	6
Experienced and Benefits-Based Management	6
Recreation Demand Hierarchy	8
Recreation Preferences	12
The Recreation Opportunity Spectrum	12
Recreation Benefit Production Model	14
Study Hypotheses	17
CHAPTER 3	
METHODS	22
Study Area	22
Study Population	23
Questionnaire Design	23

Distribution and Mailings	24
Sample Response	25
Coding	25
Analysis Methods	26
Dependent Variables	28
CHAPTER 4	
DESCRIPTION OF YELLOWSTONE AND GRAVELLY RESPONDENTS	29
Demographic Characteristics	29
Trip Characteristics	36
Reasons for Visiting	44
CHAPTER 5	
TEST OF HYPOTHESES	47
Hypothesis One	47
Identifying Factors	47
Identifying Clusters	49
Hypothesis Two	51
Preferred Setting Attributes by Segments	52
Hypothesis Three	71
Benefit Segments by Location	71
Hypothesis Four	71
Preferred Site Attributes by Location	72
Summary	91

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS	93
Discussion	93
Limitations	94
Regional Implications	96
Implications for Recreation Management	99
Future Research	100
LITERATURE CITED	103
APPENDICES	107
Appendix A	107
Appendix B	116
Appendix C	119

LIST OF FIGURES AND TABLES

FIGURES	<u>Page</u>
1. Overall Processes and Subprocesses for Producing Outdoor Recreation Benefits	16
TABLES	
1. Montana Residency by Location, in Percent	29
2. Sex by Location, in Percent	30
3. Education Level by Location, in Percent	31
4. Mean Number of Years Lived in Montana by Location	31
5. Mean Age, by Location	32
6. Adults in Household by Location, in Percent	32
7. Children in Household by Location, in Percent	33
8. Occupation by Location, in Percent	34
9. Mean Number of Years Operating a Snowmobile by Location	34
10. Mean Number of Days Operating A Snowmobile Annually by Locations	35
11. Skill Level by Location, in Percent	35
12. Type of Group by Location, in Percent	36
13. Use of Nearby National Forests by Location, in Percent	37
14. Rode Single or Double by Location, in Percent	37
15. Ownership of Snowmobile by Location, in Percent	38
16. Rental of Snowmobile by Location, in Percent	38
17. Importance of Area by Location, in Percent	39
18. Type of Accommodation by Location, in Percent	39

LIST OF FIGURES AND TABLES (Continued)

19. Source of Information of Area by Location, in Percent	40
20. Most Satisfying Aspect of Trip by Location, in Percent	41
21. Most Dissatisfying Aspect of Trip by Location, in Percent	42
22. Mean Number of Nights Stayed in Area, by Location	42
23. Mean Number of Hours Spent Riding Inside Area, by Location	43
24. Mean Number of Hours Spent Riding Outside the Area, by Location	43
25. Reasons for Visiting by Location	45
26. Most Important Reason for Visiting by Location, in Percent	46
27. Varimax Rotated Factor Loadings for the Experience Variables	49
28. Cluster Center Means	50
29. Cluster groups and the variable means are shown for each cluster size	51
30. Importance of Seeing Some Wildlife by Benefit Segment, in Percent	52
31. Importance of Seeing A Lot of Wildlife by Benefit Segment, in Percent	53
32. Importance of Scenic Overlooks by Benefit Segment, in Percent	54
33. Importance of Untracked Open Meadows by Benefit Segment, in Percent	54
34. Importance of Viewing Water by Benefit Segment, in Percent	55
35. Importance of Unique Geological Features by Benefit Segment, in Percent	56
36. Importance of Dry, Cold Snow Conditions by Benefit Segment, in Percent	57
37. Importance of Viewing Mountains by Benefit Segment, in Percent	57
38. Importance of Forested Areas Thinned by Logging by Benefit Segment, in Percent	58

LIST OF FIGURES AND TABLES (Continued)

39. Importance of Clearcuts in Forested Areas by Benefit Segment, in Percent	59
40. Importance of Looped Trails by Benefit Segment, in Percent	59
41. Importance of Long Trails by Benefit Segment, in Percent	60
42. Importance of Seeing Other People by Benefit Segment, in Percent	61
43. Importance of Little Evidence of Previous Visitors by Benefit Segment, in Percent	61
44. Importance of Others Involved in Motorized Recreation by Segment, in Percent	62
45. Importance of Others Involved in Non-Motorized Recreation by Segment, in Percent	63
46. Importance of Nature Interpretation by Benefit Segment, in Percent	63
47. Importance of Area Patrolled by Rangers by Benefit Segment, in Percent	64
48. Importance of Emergency Help Available by Benefit Segment, in Percent	65
49. Importance of Trail Markers by Benefit Segment, in Percent	65
50. Importance of A Supply of Maps by Benefit Segment, in Percent	66
51. Importance of Plowed parking Areas by Benefit Segment, in Percent	66
52. Importance of Groomed Trails by Benefit Segment, in Percent	67
53. Importance of Heated Shelters in Parking Area by Benefit Segment, in Percent	68
54. Importance of Outhouses Along the Trail by Benefit Segment, in Percent	68
55. Importance of Small Open Shelters Along Trail by Benefit Segment, in Percent	69
56. Importance of Warming Huts Along Trail by Benefit Segment, in Percent	70
57. Importance of Public Cabins by Benefit Segment, in Percent	70
58. Benefit Segments by Location, in Percent	71

LIST OF FIGURES AND TABLES (Continued)

59. Importance of Seeing Some Wildlife by Location, in Percent	73
60. Importance of Seeing A Lot of Wildlife by Location, in Percent	73
61. Importance of Scenic Overlooks by Location, in Percent	74
62. Importance of Untracked Open Meadows by Location, in Percent	75
63. Importance of Viewing Water by Location, in Percent	75
64. Importance of Unique Geological Features by Location, in Percent	76
65. Importance of Dry, Cold Snow Conditions by Location, in Percent	77
66. Importance of Viewing Mountains by Location, in Percent	77
67. Importance of Forested Areas Thinned by Logging by Location, in Percent	78
68. Importance of Clearcuts in Forested Areas by Location, in Percent	78
69. Importance of Looped Trails by Location, in Percent	79
70. Importance of Long Trails by Location, in Percent	80
71. Importance of Not Seeing Other People by Location, in Percent	81
72. Importance of Little Evidence of Previous Visitors by Location, in Percent	81
73. Importance of Others Involved in Motorized Recreation by Location, in Percent	82
74. Importance of Others Involved in Non-Motorized Rec. by Location, in Percent	83
75. Importance of Nature Interpretation by Location, in Percent	83
76. Importance of Area Patrolled by Rangers by Location, in Percent	84
77. Importance of Emergency Help Available by Location, in Percent	85
78. Importance of Trail Markers by Location, in Percent	85

LIST OF FIGURES AND TABLES (Continued)

79. Importance of A Supply of Maps by Location, in Percent	86
80. Importance of Plowed parking Areas by Location, in Percent	87
81. Importance of Groomed Trails by Location, in Percent	87
82. Importance of Heated Shelters in Parking Area by Location, in Percent	88
83. Importance of Outhouses Along the Trail by Location, in Percent	89
84. Importance of Small Open Shelters Along Trail by Location, in Percent	89
85. Importance of Warming Huts Along Trail by Location, in Percent	90
86. Importance of Public Cabins by Location, in Percent	91

Chapter 1

INTRODUCTION

Problem Definition

Snowmobiling has become increasingly popular throughout Montana in recent years and is now one of the predominant winter recreation activities in the Yellowstone Region. Nearly 75% of winter visitors to Yellowstone National Park participate in snowmobiling (Littlejohn, 1996). This has led to growing concern over winter recreation issues in this region. In 1990, Yellowstone National Park approved its most recent winter management plan, which contained two important provisions stipulating that if either occurred it would result in the need for a new winter management plan. The first condition was the completion of the Continental Divide Snowmobile Trail. The second condition was that if the number of snowmobile user days in Yellowstone National Park reached the projected visitation level of 144,000 for the year 2000. In the 1992-1993 winter season, both of these conditions had been met; this has resulted in a new round of winter management planning for the park.

Concurrent with Yellowstone's planning process, several nearby National Forests have taken a closer look at their own winter use management plans. The Gallatin, Targhee, and Beaverhead National Forests are concerned with the potential impacts that may result from whatever management strategies Yellowstone National Park decides to implement. Particularly troublesome are the potential impacts to these nearby forests if Yellowstone limits snowmobile use in the Park. However, many of these managers, particularly on the Beaverhead National Forest, lack adequate information about the current use of the area and the potential impacts. Information is lacking about the desired experiences of these winter

users and the range of recreation opportunities that should be provided within the Yellowstone Region.

Both the National Park Service and the USDA Forest Service are mandated to provide recreational opportunities which are demanded by the public. A primary objective of these agencies is to provide a range of opportunities that visitors desire and that are appropriate with the resource base. The Forest Service has adopted the Recreation Opportunity Spectrum (ROS) as a management tool, while Yellowstone National Park is implementing a system of opportunity classes. These management systems aid managers in making recreation resource allocation decisions. The basic premise of these management frameworks is that quality recreation is best assured by providing a diversity of opportunities for recreation experiences. Understanding the linkages among recreation activities, settings, experiences, and benefits is critical to public land managers in making these resource allocation decisions.

Several studies have been conducted with regards to winter visitors and snowmobile users in Yellowstone National Park during the last ten years. Two studies by The Bureau of Business and Economic Research, supported by the Institute for Tourism and Recreation Research, at the University of Montana in 1988 and 1995 examined snowmobile user characteristics and expenditure information. These studies were primarily concerned with describing snowmobile users according to their demographic characteristics and their expenditure patterns. Moisey and McCool (1993) reported on benefit segmentation and related expenditures. The current study sought to provide a more comprehensive description of snowmobile users to the park. Snowmobile users were segmented by demographic descriptors, as well as by the benefits they desired from their visit. In 1996, Littlejohn

conducted a study of Yellowstone National Park visitors which provided a comprehensive examination of winter user characteristics.

However, Yellowstone has limited information on the relationship between visitors' desired experiences and their preferred setting attributes. For areas outside the park, information on winter visitors is sparse. There has not been any systematically collected data on winter visitors to the Gravelly area. Thus, little is known about the characteristics of snowmobile users in this area or their desired experiences. In order to provide a spectrum of recreation opportunities within a regional context, it is necessary to begin to identify the experiences and settings that these recreationists seek.

Winter recreation use in this area has raised many unanswered questions: Why is Yellowstone National Park such a popular destination for snowmobiling? What are the experiences and benefits that these visitors desire and receive from recreating in Yellowstone? What types of experiences and settings do snowmobile users outside of the park seek? Are the Park Service and Forest Service providing complimentary recreation opportunities or similar opportunities?

Problem Statement

The relationship between human behavior and the environmental setting is a primary concern of recreation resource management. The human behavior approach to defining recreation requires managers and researchers to examine the psychological outcomes and benefits that are derived from recreation engagements. This knowledge is necessary in order for managers to fulfill their mandates of providing the experience opportunities which are demanded by the public. This information will allow managers to increase the probability that

recreationists will realize their desired experiences by providing the appropriate settings. Managers are able to manipulate the setting in order to provide varying types of recreation opportunities that may exist within a continuum. Managers will also be able to provide better information to potential users about the range of settings available. This will enable the recreationist to choose the most appropriate location for their desired experiences.

Significant theoretical and conceptual work within the recreation resource management field has been devoted to furthering our knowledge of recreation experiences and benefits. The underlying tenets of the Recreation Opportunity Spectrum and the Recreation Demand Hierarchy rely on the hypothesized linkage between desired experiences and preferences for settings. Within this line of reasoning, desired experiences are predictive of preferred settings (Brown and Ross, 1982). However, the focus of much of the past research has been aimed at the linkage between activity and experience and activity and setting. More research is needed to empirically test the hypothesized link between desired experiences and settings:

“Because recreation research is relatively young, ROS is based on assumptions and tenets borrowed from other lines of research. The appropriateness of these assumptions and tenets needs testing and evaluation” (Driver, Brown, Stankey, and Gregoire, 1987)

The primary purpose of this study is to answer the following question:

What is the relationship between the benefits sought and the preferred setting attributes for two groups of snowmobile users?

More specifically, the study seeks to address the following goals:

1. Identify the desired experiences of snowmobile users in Yellowstone National Park and the Gravelly Mountains.
2. Classify user types according to desired experiences.
3. Determine which setting characteristics are preferred between experience types.
4. Determine if differences in demographic characteristics and desired experiences exist between snowmobile users in Yellowstone National Park and the Gravelly Mountains.
5. Determine if differences in preferred setting characteristics exist between snowmobile users in Yellowstone National Park and the Gravelly Mountains.

Chapter 2

CONCEPTUAL FOUNDATION AND LITERATURE REVIEW

The traditional approach to understanding recreation was based on an activity oriented approach. This approach treated activities as the outcome of recreation participation. Thus, the focus of management was on providing the opportunities for visitors to engage in activities. This approach was easily adopted into the managerial structure of the public land management agencies. Managers could easily grasp this relatively straight forward approach to resource management. Thus, managers strove to provide opportunities for activities, such as hunting, fishing, and hiking. This demand for recreational activities was traditionally understood as overt demand. In other words, those demands that could be seen as a result of visitors' actions. However, this approach had serious limitations.

The activity oriented approach proved to be too simplistic. As competing recreational uses multiplied in a given area, so did user conflicts and resource degradation. Managers became confronted with the problem of how to allocate the resource base and for which activities. Principally, managers were faced with the tasks of establishing a rationale for these allocation decisions. The activity oriented approach failed to provide justifiable grounds for subsequent management actions. Since the 1960's, researchers and managers have been seeking a more fundamental understanding of recreation.

Experience and Benefits Based Management

Experience and benefits based management evolved out of the human behavioral approach to understanding and defining recreation. Driver and Tocher (1970) conceptualized

recreation as a human experience that results from intrinsically motivated recreational engagements, which are freely chosen during non-obligated time. This definition of recreation focused attention on the experiential aspects of recreation participation. Defining recreation from this perspective is similar to Wagars' (1964) notion of recreational quality. This approach to recreation views activities as a recreation behavior leading to specific outcomes. In this sense, a recreation area is viewed as a production system comprised of inputs, the participation process, and outputs (Driver and Brown, 1975). The activities and the settings are viewed as part of the process in producing the recreation experience. The experiences are viewed as being the motivation for recreation engagements.

Hendee (1973) suggested that visitors receive multiple satisfaction from their recreation engagements;

“The basic idea is that recreation resources offer people the opportunity for a range of experiences which, in turn, give rise to human satisfactions. These multiple satisfactions then lead to benefits – the ultimate goal of recreation resource management” (Hendee, 1973, p. 106).

Hendee was careful to note that satisfactions and benefits were distinctly different and that the former was part of the production of the latter. Hendee also noted that the recreation experience was produced from interactions with the ecosystem and social system. He further held that these conditions could be managed to influence the experience. In order to measure these satisfactions, a 73 item Likert type scale was proposed to identify the attributes of the hunting experience. This conceptualization laid the foundation for Driver and Browns' development of the recreation demand hierarchy.

In general, recreationists are described as engaging in specific activities in specific settings in order to receive desired outcomes (Driver and Brown, 1978). These outcomes have been defined as the experiences realized from participating in recreational pursuits (Driver and Brown, 1978). More specifically, these experiences are identified as a package of psychological outcomes that result from this participation (Manfredo et al, 1983). These psychological outcomes ultimately lead to both individual and social benefits. The individual accrues direct benefits from these psychological outcomes, such as improved physical and mental health. These outcomes then result in benefits that accrue to larger social aggregates, such as communities and society. These social benefits are characterized as more long term improvements, such as improved family cohesion and improved health of the populace.

Recreation Demand Hierarchy

Driver and Brown (1978) developed the Recreation Demand Hierarchy based on the human behavior definition of recreation and the expectancy-valence theory forwarded by Lawler (1973). Expectancy-valence theory proposes that motivation to engage in a behavior is based on the expectation that it will lead to performances and that these performances will lead to positively valued outcomes (Manfredo et al, 1983). In a recreation framework, these performances are viewed as participation in a specific activity within a desired setting; the outcomes are synonymous with the preferred experience. These experiences or outcomes are then conceptualized as ultimately leading to individual and social benefits (Driver and Brown, 1978). The recreation demand hierarchy has four levels which provide the conceptual underpinning for examining the relationship between recreation activities, recreation settings, recreation experiences, and recreation benefits. This model is described as a hierarchy because

of the increasing difficulty of identifying and measuring demand as we move to each successive level.

Level 1 of the recreation demand hierarchy relates to the demand for recreation activities. Activity based management has an intuitive appeal for recreation managers. Activity opportunities are easily identifiable and can be readily provided in the appropriate environment. These opportunities simply relate to a diverse set of activities, such as hiking, fishing, hunting, and rafting. However, this activity oriented management has proved to be problematic because of its simplistic orientation. Recreationists do have activity preferences, but these activities are simply a means to an end. By simply managing for these activity opportunities we negate the underlying reasons for recreational engagements and thus are unable to provide opportunities for satisfying experiences.

Level 2 of this hierarchy is concerned with the demand to experience the situational attributes of the setting. The setting has been conceptualized as comprising of three elements: 1) the physical setting, 2) the social setting, and 3) the managerial setting. The physical setting is composed of the various elements of the landscape, such as the degree of forestation, type of water sources, and the abundance of wildlife. These are the natural components of an area and each specific resource is described as having an intrinsic capability to support certain types of opportunities. For example, one cannot hope to downhill ski without a slope or whitewater raft without rapids. Conversely, a remote wilderness destination may not be the appropriate place for a large picnic. Thus, certain types of environments lend themselves more readily to specific types of recreational pursuits.

The social setting is generally comprised of those attributes which relate to other visitors. This can include the number of other people encountered, the noise associated with

other users, and the presence of litter, among other things. This social setting can also be extended to examining the type of users present and their behavior. For example, water skiers and their use of fast motor boats are generally incompatible with fishing. Thus, the social component of the recreation setting can be seen as a critical element related to the recreation experience of the setting. Similarly to the physical setting, certain areas are more amenable to differing social conditions. One would expect to encounter numerous others within a city park, but a quite different social setting would be preferred for an alpine lake.

The managerial setting refers to attributes, such as the presence of facilities, signs, access fees and use restrictions. The managerial setting is generally viewed according to the degree that managerial actions influence the area. Even the presence or absence of management personnel will affect the setting. The managerial component of the setting, as the name implies, is the most amenable to manipulation and control by managers. Recreationists are assumed to have preferences for different types of management settings. As with the other setting components, the managerial aspects also can be found to have a desired range of influence on the setting experience. Depending on the characteristics of the area, certain management actions readily lend themselves to some environments, but not to others.

Level 3 of the demand hierarchy is concerned with the demand for those psychological outcomes that result from participation in a desired activity in a preferred setting. In contrast to the activity oriented approach to recreation, the experience-based model suggests that the activity and the setting are part of the production process resulting in recreation experiences. This level of the hierarchy seeks to answer questions regarding the reasons that recreationists choose to participate in a chosen activity in a particular environment.

In this context, the experiences are seen as the direct outcomes which are produced by the recreationists through their recreation participation. These experiences are defined as psychological outcomes, such as taking risks, improving skills, and temporary escape. Generally, more than one outcome is achieved; thus, a recreationist will receive several outcomes from their participation. These outcomes have been referred to as “bundles” or “packages” of outcomes (Driver and Brown, 1978; Manfredi et al, 1983). These are equivalent to Hendee’s (1974) multiple satisfactions and the collection of these salient satisfying experiences are viewed as resulting in the overall recreation “experience opportunity” (Brown, 1983). Within this framework, recreationists are viewed as having preferred experiences. Thus, in order to achieve these desired outcomes the recreationist participates in a chosen activity within a preferred type of setting.

Level 4 of the hierarchy deals with the demands for opportunities to realize benefits that flow from the psychological outcomes of a satisfying recreation experience. From this perspective, recreation experiences are the intermediate outcomes in the production of recreational benefits (Brown, 1983). The immediate benefits accrue to the individual, while the production of benefits ultimately result in benefits to society. Recreation benefits have been defined as being: 1) an improvement of current conditions, 2) prevention of an unwanted condition, and 3) a desired condition (Driver, 1995). In other words, recreation benefits are generally understood to be an improvement in one’s physical and mental health. The second component was added by Driver (1995) in reference to the maintenance of one’s current condition, or the prevention of a decline in condition. The third component is concerned with those benefits that are preferred or salient to the recreationist. These desired benefits are the ultimate goal of recreation management.

Recreation Preferences

Demand in the context of this hierarchy is equated with the preferences of the recreationist. There is demand for activity opportunities, setting opportunities, and experience opportunities (Driver and Brown, 1975). This demand has also been extended to include the opportunity for preferred recreation benefits. Level 3 of the demand hierarchy is concerned with the experience preferences of the visitor. In this sense, an individual will choose a recreation activity and setting in order to realize a desired or preferred experience. These experiences have been described here as psychological outcomes, thus the demand for recreation experiences is a psychological demand for a set of salient and preferred outcomes.

Preferred recreation benefits have been defined in this paper as the ultimate goal of recreation resource management. The recreation demand hierarchy builds on the assumption that each successive level becomes increasingly more difficult to measure. This increases the difficulty of managers to provide opportunities for these benefits. To resolve this problem, preferred experiences and preferred benefits are often used synonymously by managers and researchers. This is possible because the recreation experience is understood to result in immediate benefits to the individual recreationist. Thus, for this study the demand for preferred psychological outcomes will be equated with a demand for recreation benefits.

The Recreation Opportunity Spectrum

From the early part of the century, the need to provide a diversity of recreation opportunities was being advocated through the writings of many influential figures: Fredrick L. Olmstead, Arthur Carhart, Aldo Leopold, Robert Marshall, J. Allen Wagar, and Roderick Nash (Driver et al. 1987). The basic premise upon which the need for diversity rests is

freedom of choice (Driver and Brown, 1978). In our democratic country, our institutions and cultural are oriented around the basic desire for individuality and choice. Early attempts in the 1960's and 1970's at inventorying and classifying public lands according to a recreation spectrum were found to be inadequate due to the orientation toward activity production (Driver and Brown, 1987). The Recreation Opportunity Spectrum (ROS) evolved out of earlier opportunity spectrum frameworks, but with a distinctly different focus. The ROS system was concerned with providing a range of experience opportunities.

The Recreation Opportunity Spectrum (ROS) is based on preserving freedom of choice. Recreation demand can be viewed as existing on a continuum. If managers were to attempt to manage for some elusive "average" visitor, then the majority of recreationists would not be accounted for. The ROS framework is thus designed to provide a diversity of recreation opportunities. The recreation demand hierarchy provides the conceptual basis for the ROS framework. With an understanding of this demand hierarchy, Driver and Brown (1978) have described ROS as having three primary criteria: 1) the spectrum should include activity opportunities that range from one extreme to the other, 2) the spectrum should include a similar range of experience opportunities, and 3) settings should be defined that correspond to these activity and experience opportunities.

The ROS system is thus defined as having three main components: activity opportunities, setting opportunities, and experience opportunities. The setting is the most crucial element to the recreation manager. The setting is composed of physical, social, and managerial attributes; the manager is able to manipulate these attributes in order to provide activity and experience opportunities. The recreation experience depends on the availability of particular combinations of activities and settings (Driver et al, 1987). Therefore, as the setting

attributes are varied along the spectrum, the opportunities for experiences will also become more variable. Information on visitor preferences can help guide managers in providing the opportunity for satisfying experiences. Conversely, information on existing setting characteristics can aid recreationists in choosing an appropriate location for their particular activity and preferences (Clark and Stankey, 1979). This information exchange will increase the probability of a satisfying recreation experience.

Recreation Benefit Production Model

The Recreation Benefit Production Model will serve as the proposed conceptual framework for this study. Brown (1984) developed this model (Fig. 1) of the recreation production process which provides the context for understanding how the conceptual frameworks of the Recreation Demand Hierarchy and the Recreation Opportunity Spectrum fit together in an overall system. This recreation production model provides a good contextual format for examining the flow of inputs and outputs within the system.

We begin with the basic resources; this can best be thought of in terms of the physical, social, and managerial setting. The components of the recreation setting leads directly to management activities; this is the actual manipulation of the setting attributes by managers. Thus, the setting is manipulated by managers to provide opportunities for recreation experiences. Yellowstone and the Gravelly's can each be viewed as having different combinations of setting attributes. Variation will occur within each area, but there should be less variation within each area than between areas. The first three boxes of this model can be seen to incorporate the fundamental components of ROS.

The consumer inputs box refers to the past experiences and knowledge of the recreationist, combined with the investment and effort they make in order to engage in a recreation pursuit. For the snowmobile users in this study, this will include such variables as: skill level, travel distance, time commitment and monetary investments. Consumer activities can best be understood as the actual recreation participation, such as hiking, fishing or snowmobiling. The consumer output box can then be seen as the psychological outcomes or desired experiences that the recreationists receives from this participation. Snowmobile users may receive experiences, such as risk taking, escape, or achievement. These experiences are then processed (individual activities) into the immediate benefits (individual outputs) which accrue to the individual. These benefits may include improved physical fitness or stress reduction. These individual benefits ultimately lead to social benefits (societal outputs).

These components of the recreation production model are basically the incorporation of the demand hierarchy. An important element that this model highlights is that managers do not provide the recreation experience. Managers are only responsible for providing the opportunities for the experience. The visitor brings past knowledge, skills, and experiences to each recreation engagement. It is the interaction of these past experience with the current participation that results in the experience (Clark and Stankey, 1979). For example, different users can be seen has having varying skill levels of using snowmobiles and past experiences, as well as a range of attitudes and values. These personal attributes will influence the each users expected and desired experiences and thus their preferred types of settings. When the visitor participates in a snowmobile engagement, their past experiences interact with current conditions to produce the recreation experience.

RECREATION BENEFIT PRODUCTION MODEL

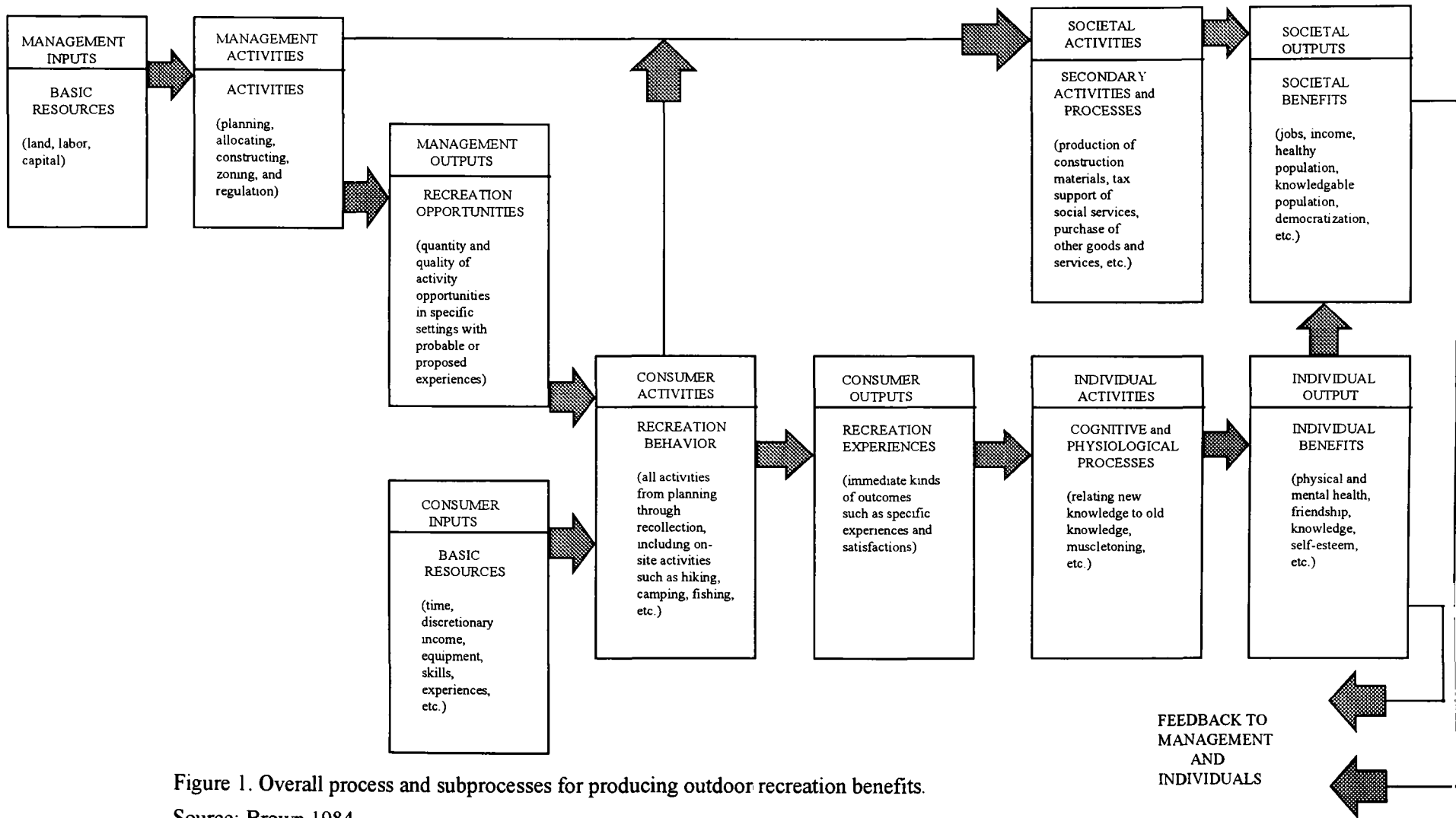


Figure 1. Overall process and subprocesses for producing outdoor recreation benefits.
 Source: Brown 1984

Study Hypotheses

Driver (1977) has developed an extensive set of experience domains in order to identify and measure these psychological outcomes of the recreation experience. The Recreation Experience Preference (REP) scales have been refined and empirically tested over the last twenty years. There are currently 43 scaled items used to measure the importance of various psychological outcomes of recreation engagements. These scales have been statistically clustered into 19 general experience “domains”, such as “enjoy nature”, “reduced tension”, and “outdoor learning” (Driver et al., 1991). Each domain is measured by at least one scale, most domains consist of several scales which are closely related to each other. The REP scales have been widely used and tested by researchers to confirm their reliability and validity (Rosenthal et al., 1982).

These REP scales are also used to segment users into “Object Types” or experience types (Driver et al., 1991). Users are clustered according to their most highly valued REP’s and then analyzed for social demographic and other characteristics. This allows for a more comprehensive profile of the user and the benefits they receive. Dozens of studies have been conducted using REP scales to identify and measure desired experiences. Most of these studies have focused on identifying these experiences; exploring the activity to experience linkage, or examining the activity to setting relationship. Significantly fewer studies have examined the linkage between desired experiences and setting preferences (Brown and Ross, 1982).

Hautalouma and Brown (1979) reported on a study focused on identifying different types of hunters based on their experience preferences. Different types of hunters were derived from a cluster analysis and their preferences were determined for each group. These

hunters were put into experience types and then compared against their demographic characteristics. This typing was done in order to improve our ability to study the demand for many types of experiences. Results indicated that these hunter groups were generally homogenous in their preferred outcomes. Brown and Haas (1980) performed a similar analysis on wilderness users. This study empirically identified 40 scale items and eight experience domains. User groups were clustered according to their experience preferences. The authors were able to identify five types of wilderness users. This analysis allowed them to segment this market of wilderness users.

Moisey and McCool (1993) identified five benefit segments with regards to snowmobile users in Yellowstone National Park. These benefit segments are synonymous with the object types described previously. These research results are consistent with previous efforts that have found that experience preferences vary not only from activity to activity, but they also vary among individual users within the same activity (Driver and Brown, 1978). However, researchers have found that the variation between users engaged in the same activity is not as great as the variation found between visitors engaged in different activities. Moisey and McCool's study supports the contention that the variation between users engaged in the same activity can be measured. This leads us to the first hypothesis;

H₁: There are definable segments of snowmobile users which differ according to the specific experiences they desire.

In one of the earliest studies into desired experiences and preferred settings, Haas, Allen and Manfredo (1979), found empirical support for eight hypothesized psychological outcomes. Three general findings were reported with regard to the measurement of these outcomes: 1) preferred recreation experiences can be identified by specific psychological

outcomes, 2) these preferences vary among recreationists to an area, and 3) some outcome domains remain consistent between areas, thus indicating the possible substitution among settings for the same experiences. This study also empirically identified nine setting attributes: meadows/forest, water-related, wildlife, dense vegetation, rugged topography, unique natural, fish-related, nuisances, and man-made intrusions. These attributes were measured for their contribution to satisfaction. The general results for the setting attributes relate to the previous findings. They found that the setting can be identified, preferences for these settings can vary among visitors to an area, and preferences for some settings attributes can remain constant across areas.

McLaughlin and Paradise (1980) reported on a study of snowmobile users and skiers that tested the relationship between activity, setting, and experience. This study measured the setting according to physical, social, and managerial attributes. Numerous attributes were measured that corresponded to their respective setting dimension. This study found significant differences for desired experiences and preferred setting attributes between snowmobile users and skiers. With regards to the setting their finding suggested that some setting characteristics are more directly linked to activity type than experience type.

Brown and Ross (1982) reported on a study which included an investigation into the relationship between desired experiences and settings. This study defined the setting according to the ROS classification framework. Their findings support the notion that desired experiences are important to the recreationists preferences for settings. Although different experiences have varying degrees of importance for setting preferences. They also suggest that controlling for activity type will allow a more precise examination of these relationships. In a study of visitors to three wilderness environments, Manfredo et al. (1983) grouped users

into experience types and tested for differences in their activity and setting preferences. This study found limited support for the notion that different experience groups differ in their activity and setting preferences. However, they note that these results may simply reflect the fact that wilderness users tend to be a rather homogenous group.

Viriden and Knopf (1989) also examined the relationship between activity, desired experiences, and the environmental setting. The setting was operationalized according to the ROS defined categories. Results suggest that activity preference is not independent of setting preference. Ambiguous results were found with regards to activity preference and desired experience. Mixed results were also found for relationship between desired experiences and preferred settings. However, systematic linkages between setting and experience preferences were found. These results are indicative of the general complexity of these relationships, however, the data suggest that a relationship among these variable does exist.

In general, these research studies have found some support for the hypothesized relationship between activities, desired experiences, and preferred settings. Moreover, a more precise finding is expected when the activity is held constant. Although, the degree of variation in desired experiences and preferred settings is expected to be less for users participating in the same activity compared to users engaged in different activities. Thus,

H₂: The physical, social, and managerial setting preferences will differ
among snowmobile users desiring different types of experiences.

Schreyer, Knopf, and Williams (1984) have questioned the ability to predict specific behavioral or environmental choice through the use of motive scores (REP scales). They cite three main limitations of this approach: 1) the lack of specificity in the motive scales, 2) a problem with motive intensity, and 3) conceptual semantics. The primary limitation deals with

the contention that the current motive scales provide only a general description of motivations. The authors have proposed an interesting and insightful discussion on the subject of recreation motivations, but further exploration is needed to address the possible connection between desired experiences and preferred setting. This study of snowmobile users is aimed directly at exploring these hypothesized connections.

The final two research hypotheses are oriented toward the comparison between the snowmobile users in Yellowstone National Park and those in the Gravelly Mountains. Hypotheses three and four are logical extensions of the first two hypotheses. If we assume that there are indeed definable segments of snowmobile users and these segments desire different types of settings, then we would expect to find a disproportionate number of the benefit segments in each location. In other words, if the suggested linkage between activity, experience, and settings does exist, then users with different experience preferences will rationally choose one location over the other. Thus,

H₃: Snowmobile users in Yellowstone National Park and the Gravelly Mountains desire different experiences, and

H₄: Snowmobile users in Yellowstone National Park and the Gravelly Mountains desire different settings.

Chapter 3

METHODS

The sampling objective for this study was to obtain a representation of adult snowmobile users in West Yellowstone and the Gravelly Mountains. Each location was treated as an independent sample. The purpose of this chapter is to describe the research methodology used for this study. The first part of this chapter describes the study area and the study population. The following sections deal with the construction of the questionnaire, the data collection, and the sample response. Finally, the coding of the data and the data analysis procedures are presented.

Study Area

The study area for this research project was the West portion of Yellowstone National Park and the West Fork area of the Gravelly Mountain Range. These areas are encompassed within the Greater Yellowstone Area. The West Yellowstone region supports a significant amount of winter visitor use and snowmobiling is the predominate winter activity in the area; approximately 74% of winter users in Yellowstone National Park participate in snowmobiling (Littlejohn, 1996). The portion of the Gravelly Mountain Range of concern here is an area which is part of the Beaverhead National Forest. The West Fork of the Gravelly Mountains is approximately 30 miles to the northwest of West Yellowstone. This area of the Gravelly's receives a significant amount of recreational use in the winter. Similar to Yellowstone, a primary activity in this area during the winter is snowmobiling.

Study Population

The study population was defined as all persons age 18 and over who were visiting near the West entrance of Yellowstone National Park or the West Fork of the Gravelly Mountains and intended to operate a snowmobile for recreational purposes during the 1997 winter season. The two populations were sampled as follows: visitors to Yellowstone National Park were selected at various locations in West Yellowstone, such as snowmobile rental stores and hotels catering to winter visitors. Visitors to the West Fork of the Gravelly's were selected primarily at the snowmobile unloading area near the main Gravelly snowmobile entrance. This location was used to sample the bulk of the snowmobile users in the West Fork area. This sampling approach for both locations was employed primarily because of environmental, time, and fiscal constraints. The snowmobile user sampling plan (Appendix C) contains the dates and times of the for each sampling period.

Questionnaire Design

A self response questionnaire was used to conduct this snowmobile user survey. The questionnaire was designed to gain visitor information in the following areas of interest:

1. Social demographic characteristics (age, sex, occupation, etc.)
2. General trip characteristics (length of stay, location, etc.)
3. Desired experiences (REP scales)
4. Setting attribute preferences (physical, social, and managerial)

Driver's (1977) REP scales were used to determine the preferred experiences of the snowmobile users participating in the study. In order identify these experiences, survey participants were asked to rate the importance of 23 reasons for visiting Yellowstone National

Park or the Gravelly Mountains, respective of the area they were sampled in. These preferred experience variables were used to identify benefit segments within the sample. These benefit segments were then used as the independent variables for analyzing the setting attribute variables in the survey. Location was used as an independent variable to analyze the social demographic, trip characteristic, and setting preference variables. For the benefit cluster analysis, all cases were used as one sample and for the location analysis each area (Yellowstone and the Gravelly's) was used as an independent sample.

The physical, social, and managerial setting attributes were also an important component of the survey instrument. Survey participants were asked to rate the importance of 28 recreation setting attributes. These attributes reflected a wide range of site conditions that may or may not exist in each area. It has been hypothesized that for some activities such as snowmobiling, the recreationist might be more attuned to the vehicle and the immediate surroundings than to a setting characterized by an ROS framework. Therefore, a list of site attributes was used to evaluate the physical, social, and managerial components of the setting. These specific attributes were used in order to more clearly assess the survey participants.

Questionnaire Distribution and Mailings

Data was collected through an on-site, mail return questionnaire. Participants choosing to return the questionnaire by mail were asked to provide their name, address, and age on a registration form. These participants were then given a questionnaire (Appendix A) with a postage paid return envelope. Respondents were asked to complete the questionnaire and return it at their earliest convenience. A modified Dillman procedure was used with regards to these mailings. Each registration form and survey contained an identification number. This

allowed the researcher to keep track of returned questionnaires. A replacement questionnaire and cover letter (Appendix B) were mailed to non-respondents approximately 10 days after the initial contact.

Sample Response

Visitor contacts resulted in 114 willing participants for the Yellowstone sample and 130 for the Gravelly sample. Approximately 3% of the snowmobile users contacted at both locations declined to take part in the study. Seventy-three of the Yellowstone participants filled out the questionnaire on-site and 41 agreed to return the survey by mail. The response rate for all the survey participants in the Yellowstone sample was 89%. For the mail back portion, 29 of the surveys were returned giving a response rate of 71%. Twenty of the Gravelly participants filled out the questionnaire on-site and 110 agreed to return the survey by mail. The response rate for all the survey participants in the Gravelly sample was 77%. For the mail back portion, 80 of the surveys were returned giving a response rate of 73%. Since the overall response rate for the mailing portion of these samples was higher than 70%, the effects of any non-response bias was determined to be negligible (Dillman, 1978).

Coding

In order to identify the types of experiences that visitors are seeking, survey participants were asked to rate the importance of 23 reasons for visiting Yellowstone National Park or the Gravelly Mountains, respective of the area they were sampled in. These 23 items were identified from Driver's "Item Pool" of recreation experience preference (REP) scales (1980). The survey respondents were asked to rate the importance of each of these items in

regard to the area they chose to visit. These responses were then coded from 1 (not at all important) to 6 (extremely important), depending on how the respondents' rated each item. This same 6 point scale was also used to code responses for the respondents preferred site attributes. This 6 point scale was used in order to be consistent with previous studies.

Analysis Methods

Both the Yellowstone and Gravelly samples were combined into one large sample for conducting the factor and cluster analyses. This was done primarily because the goal of the survey was to test for differences among the benefit segments that were developed from this analysis. If the factor and cluster analyses were done on both samples separately, the results could not be meaningfully compared. To clarify, if the samples were analyzed separately each sample would produce different benefit segments. If a third variable was then analyzed based on these benefit segments the results would be confounded. A secondary reason for this approach was the need to have a large enough sample size to adequately perform this analysis. A generally rule of thumb for factor analysis is to have 100 respondents or 10 respondents for every scale item, whichever is largest (Crocker and Algina, 1986). There were 23 scale items in this survey giving a recommended sample size of 230. This study had an overall sample of 202 cases, thus giving a slightly smaller than optimal sample size.

The analysis of this survey data was performed on an IBM compatible computer using the statistical software package SPSS 6.1 (Norusis, 1994) and SPSS 7.0 (Norusis, 1997). Missing values were excluded pairwise; thus, each case in the analysis was required to have valid values on all the relevant variables in the test, otherwise the case was deleted. The importance of excluding cases pairwise means that the number of cases being analyzed will

fluctuate depending on which variables are being tested; this generally maximizes the number of cases on each test. Only factors with Eigenvalues greater than 1 were utilized for further analysis. Coefficients with values below .40 were suppressed. All coefficients with values larger than .40 were evaluated for inclusion in a relevant factor. Scales were created for each factor by summing the importance ratings of each variable in the factor and dividing by the number of variables. The scales developed from the items that loaded on each factor were tested for reliability with a Chronbach's Alpha procedure.

A cluster analysis was conducted to determine if distinct benefit segments existed among the respondents. The goal of cluster analysis is to identify groups of respondents in which there is homogeneity within the groups, but heterogeneity between the groups (Sheppard, 1996). Cluster analysis utilizes the factor scale scores generated from the factor analysis. A k-means non-hierarchical cluster analysis procedure was performed on these factors because this part of the analysis was exploratory. A hierarchical cluster procedure requires a hypothesis as to the number of clusters that are expected; this was not the case for this study.

In the k-mean cluster analysis, factor scale scores are analyzed for similarities among the cases. The non-hierarchical procedure requires the number of clusters to be identified before each test. Based on the number of clusters requested, clusters are then formed by placing each case into a cluster with similarly scored cases. After the clusters have been formed, a cluster table is developed for which a mean score is reported for each factor based on the cluster membership. Stopping rules for selecting the appropriate number of clusters using a non-hierarchical procedure are not clearly stated in the literature and is thus normally a subjective process (McCool and Reilly, 1993).

In this analysis, a decision on the appropriate number of clusters was based on three main criteria. First, the number of clusters selected was restricted by the sample size. Each cluster was required to have a large enough sample size so that segment comparisons on other variables were possible. Second, the between means and within means distances were compared for each cluster analysis procedure and the ratio of these two means was then calculated. The goal here was to identify the largest ratio. In other words, the goal was to select the number of clusters in which the between means distances were maximized and the within means distances were minimized. Third, the number of clusters selected was influenced by looking for useful differences in the mean factor scale scores between the clusters.

Dependent Variables

Statistical tests were performed on the 28 setting attribute variables to determine if significant differences existed between the benefit segments. This analysis utilized chi-square tests with a .05 level of significance. There was a problem with small cell size in several of the chi-square tests. Small cell size results when some of the response categories in a given variable have an expected values of less than five. However, small cell size is not usually a problem unless they constitute more than 20% of cells in any given chi-square test (Norusis, 1994). When the proportion of small cells exceeded 20% for any given test, the uncertainty of the results was stated.

Chapter 4

DESCRIPTION OF YELLOWSTONE AND GRAVELLY RESPONDENTS

The description of the Yellowstone and Gravelly samples has been divided into three sections. The first section explores demographic characteristics, such as, age, sex and education. The second section is concerned with trip characteristics, including length of stay, accommodations, and satisfaction. The final section examines the respondents' reasons for visiting. All of the variables are compared and contrasted in order to better understand the population of each sample.

Demographic Characteristics

There is a significant difference in Montana residency status between the two user groups (Table 1). The overwhelming majority of Yellowstone National Park visitors, approximately 91%, were from out of state. The residency pattern was just the opposite for the Gravelly respondents. Approximately 81% of the Gravelly visitors were Montana residents.

	Yellowstone (N=102)	Gravelly (N=99)	
Yes	8.8%	80.8%	
No	91.2%	19.2%	
Chi-Square	Value	DF	Significance
	105.51	1	.00000

Results indicate that there is a significant difference in sex ratios between the Yellowstone and Gravelly user groups (Table 2). There is a much higher proportion of males to females in both locations. However, this ratio is significantly greater in the Gravelly area; close to 90% of the Gravelly respondents were male. In comparison, just under 30% of the Yellowstone respondents were female. Overall, it appears that men dominate snowmobiling in both areas and women are more likely to ride in Yellowstone National Park than the Gravelly Mountains.

	Yellowstone (N=99)	Gravelly (N=99)	
Male	71.7%	88.9%	
Female	28.3%	11.1%	
Chi-Square	Value	DF	Significance
	9.23	1	.00238

A significant difference in education level was found between the Yellowstone and Gravelly respondents (Table 3). In general, the Yellowstone users tended to have a higher education level. The Yellowstone sample had a slightly larger proportion of college graduates and a much larger number of users with a post graduate level education. The Gravelly sample had a slightly larger proportion of users with some college and a much higher number of users with a high school education.

	Yellowstone (N=99)	Gravelly (N=97)	
High School	23.2%	39.2%	
Some College	32.3%	37.1%	
College	24.2%	19.6%	
Graduate School	20.2%	4.1%	
Chi-Square	Value	DF	Significance
	17.17	4	.00179

A statistically significant difference in the mean number of years lived in Montana was found between the Yellowstone and Gravelly samples (Table 4). The data tends to support the conclusion that the Montana residents visiting the Gravelly's have resided in the state longer than those residents who visit Yellowstone. However, all conclusions from this test must be viewed with caution due to the small sample size of Montana residents in Yellowstone

	Yellowstone (N=8)	Gravelly (N=71)	<u>Significance</u>
Mean	21.1	36.9	.0264
Standard Deviation	20.4	15.5	

Results indicate that there is no significant difference in age between the Yellowstone and Gravelly respondents (Table 5). The mean age for both groups was approximately 40 years old. Ages ranged from 20 to 70 years for the entire sample; both samples had a similar range and distribution. No one under 18 years old was selected for participation in this study. Therefore, analysis of the age distribution within these area is only relevant to the adult population of visitors.

	Yellowstone (N=99)	Gravelly (N=99)	<u>Significance</u>
Mean	40.8	42.9	.1964
Standard Deviation	12.6	11.0	

The number of adults living in the respondents' households did not significantly differ between the two samples (Table 6). In fact, the sample distributions were nearly identical. The majority of households consisted of two adults. An equal proportion of households, about 15% each, consisted of either one adult or three or more adults.

	Yellowstone (N=98)	Gravelly (N=99)	
One	15.3%	15.2%	
Two	70.4%	70.7%	
Three or more	14.3%	14.1%	
Chi-Square	Value	DF	Significance
	.00212	2	.99894

Test results indicate that there is a statistically significant difference between the two samples in the number of children in the respondents households (Table 7). However, in practical terms the data is fairly similar. The main difference between the samples is that the Gravelly participants are somewhat more likely to have two children in the home, while the Yellowstone participants are much more likely to have three or more children living at home.

	Yellowstone (N=98)	Gravelly (N=99)	
Zero	58.2%	62.6%	
One	12.2%	13.1%	
Two	13.3%	21.2%	
Three or more	16.3%	3.0%	
Chi-Square	Value	DF	Significance
	11.02	3	.01161

No significant difference in occupation was found between the two samples (Table 8).

In general, professionals, managers, and craftsman were the most frequently reported occupations among the Yellowstone respondents, representing 42% of the sample.

Professionals, managers, and craftsmen were also the most frequently cited occupations among the Gravelly respondents, representing 43% of the sample. The biggest differences in occupation between the two samples was that Yellowstone had a greater proportion of retired persons and housewives, while the Gravelly sample had more laborers and craftsmen.

Table 8 Occupation by Location, in Percent

	Yellowstone (N=98)	Gravelly (N=96)		
Professional	14.1%	10.1%		
Manager/Administration	17.2%	14.1%		
Sales	6.1%	5.1%		
Clerical	4.0%	3.0%		
Craftsmen	11.1%	19.2%		
Operatives	7.1%	5.1%		
Transport Equipment	2.0%	5.1%		
Laborer	3.0%	9.1%		
Farmer	4.0%	2.0%		
Service Worker	6.1%	9.1%		
Student	1.0%	4.0%		
Housewife	8.1%	2.0%		
Retired	9.1%	3.0%		
Armed Services	0.0%	1.0%		
Unemployed	1.0%	1.0%		
Self Employed	6.1%	7.1%		
Chi-Square	Value	DF	Significance	
	18.69	15	.22828	

Test results indicate that there is a significant difference between the two samples based on the number of years the respondents have operated a snowmobile (Table 9). The mean number of years riding was approximately 18 for the Gravelly sample and 8 for the Yellowstone sample. This, data supports the conclusion that in general the Gravelly users have operated snowmobiles for a significantly longer time than the Yellowstone users.

Table 9 Mean Number of Years Operating a Snowmobile by Location

	Yellowstone (N=102)	Gravelly (N=100)	<u>Significance</u>
Mean	8.2	17.6	.0000
Standard Deviation	9.6	9.8	

The Gravelly respondents spend an average of approximately 36 days of riding per year, compared to 18 annual riding days for the Yellowstone sample (Table 10). Results indicate that the Gravelly sample have spent a significantly larger mean number of days riding per year. This reinforces our supposition that the Gravelly users tend to be more experienced riders.

	Yellowstone (N=99)	Gravelly (N=100)	<u>Significance</u>
Mean	17.8	37.6	.0000
Standard Deviation	31.5	30.6	

A significant difference was found between the two samples based on the respondents' self reported skill level (Table 11). The primary difference is that the Gravelly respondents tended to be more experienced riders. They had a much higher proportion of expert riders compared to the Yellowstone sample. In fact, slightly more than two-thirds of the Gravelly sample reported themselves as expert riders. The Yellowstone sample had a significantly larger proportion of beginning riders, as well as a higher proportion of intermediate riders.

	Yellowstone (N=101)	Gravelly (N=100)		
Beginner	30.7%	3.0%		
Intermediate	41.6%	29.0%		
Expert	27.7%	68.0%		
Chi-Square	Value	DF	Significance	
	42.10	2	.00000	

Trip Characteristics

Results indicate that there is a statistically significant difference in group type between the Yellowstone and Gravelly visitors (Table 12). However, in practical terms the data is fairly similar. Most of the respondents at both locations reported that they were with friends. A large portion of the visitors also reported that their group consisted of friends and family. Few of the respondents identified themselves as couples or with family only, although these groups were more common in Yellowstone.

	Yellowstone (N=101)	Gravelly (N=97)	
Couple	12.9%	2.1%	
Family	8.9%	5.2%	
Friends	48.5%	63.9%	
Friends and Family	29.7%	28.9%	
Chi-Square	Value	DF	Significance
	10.72	3	.01331

Results indicate that there is a significant difference between the groups based on whether they went snowmobile riding in nearby National Forests (Table 13). Approximately 72% of the Yellowstone National Park visitors rode their snowmobiles on Forest Service lands. Thus, most of the Yellowstone visitors complimented their visit to the Park with riding in the National Forests. A slight majority, about 56%, of the Gravelly visitors stayed within the Gravelly Mountain range. The remaining 44% chose to take longer rides and travel into other National Forests.

	Yellowstone (N=102)	Gravelly (N=99)	
Yes	71.6%	44.4%	
No	28.4%	55.6%	
Chi-Square	Value	DF	Significance
	15.19	1	.00010

Results indicate that there is a statistically significant difference in whether people ride single or double on their snowmobile between the two user groups (Table 14). In practical terms, the data suggests that most people from both locations ride single, but the Yellowstone sample are more likely than the Gravelly sample to ride double. Almost all the visitors to the Gravelly's rode single; the few who rode double were typically riding with small children.

	Yellowstone (N=102)	Gravelly (N=99)	
Single	84.3%	97.0%	
Double	15.7%	3.0%	
Chi-Square	Value	DF	Significance
	9.40	1	.00217

There is a significant difference in the proportion of respondents who owned a snowmobile in each of the locations (Table 15). Almost all of the Gravelly visitors, 97%, owned their own snowmobile. In contrast, a majority of the Yellowstone visitors did not own a snowmobile. A note of caution is warranted here: actual snowmobile ownership in the Yellowstone population may be greater than this sample reflects, due to sampling procedures.

	Yellowstone (N=102)	Gravelly (N=100)	
Yes	37.3%	97.0%	
No	62.7%	3.0%	
Chi-Square	Value	DF	Significance
	81.31	1	.00000

Results indicate a statistically significant difference in rental rates between Yellowstone and Gravelly visitors (Table 16). None of the visitors to the Gravelly reported that they had rented a snowmobile for their trip. The few people in this group that did not own a snowmobile reported that they borrowed one from a friend. On the other hand, 69% of the Yellowstone sample reportedly rented a snowmobile on their visit. A note of caution is warranted here: the proportion of sample respondents in Yellowstone who rented a snowmobile may be higher than what may exist in the overall Yellowstone snowmobile population because of sampling procedures.

	Yellowstone (N=102)	Gravelly (N=100)	
Yes	68.6%	0.0%	
No	31.4%	100.0%	
Chi-Square	Value	DF	Significance
	105.02	1	.00000

Survey participants were asked to rate how important the area they visited was, in regards to their participation in snowmobiling (Table 17). Results indicate that there is a statistically significant difference between the two user groups on this variable. The majority

of all the participants felt the area they visited was moderately to very important. However, a much larger proportion of the Gravelly respondents rated the area as very important.

Table 17 Importance of Area by Location, in Percent

	Yellowstone (N=102)	Gravelly (N=100)	
Not at all Important	10.8%	1.0%	
Slightly Important	3.9%	3.0%	
Somewhat Important	21.6%	12.0%	
Moderately Important	24.5%	17.0%	
Very Important	39.2%	67.0%	
Chi-Square	Value	DF	Significance
	19.74	4	.00056

There is a significant difference in the type of accommodations used by visitors to Yellowstone and the Gravelly mountains (Table 18). Three-quarters of the Yellowstone respondents chose to stay in a motel. The main difference between the two groups is that the Gravelly visitors are predominately Montana residence and they tend to stay at home at night. In contrast, the Yellowstone visitors are predominately non-residents and do not have this option.

Table 18 Type of Accommodation by Location, in Percent

	Yellowstone (N=102)	Gravelly (N=99)	
Motel	75.5%	24.2%	
Cabin	5.9%	4.0%	
Home	2.9%	66.7%	
Other	15.7%	5.1%	
Chi-Square	Value	DF	Significance
	91.47	3	.00000

Results indicate a significant difference between the two samples on based on their sources of information for the area they visited (Table 19). The majority of the respondents in both groups received their information from friends or family members. Past experience was the second most common response both groups, but more so for the Gravelly sample. Nearly 17% of the Yellowstone sample received their information from magazines. The Yellowstone sample was also more likely to get information from other sources, such as brochure, the Chamber of Commerce, and travel agents.

	Yellowstone (N=94)	Gravelly (N=98)	
Friends and Family	56.4%	62.2%	
Past Experience	16.0%	30.6%	
Magazine	14.9%	0.0%	
Other	12.8%	7.1%	
Chi-Square	Value	DF	Significance
	20.80	3	.00012

Survey participants were asked to identify the most satisfying aspect of their snowmobile trip (Table 20). The *other* category consists of aspects, such as terrain, exploring, and the quality of service. Results indicate a significant difference between the two samples based on reported satisfaction. The Yellowstone respondents were most satisfied by the wildlife and scenery of the Park. The Gravelly respondents were most satisfied with the snow conditions and the open space. This lends support to the notion that the Yellowstone visitors use snowmobiles to see the Park, while the Gravelly visitors go to this are for good riding conditions. However, the scenery also appears to be an important aspect of the Gravelly snowmobile experience as well as for Yellowstone.

 Table 20 Most Satisfying Aspect of Trip by Location, in Percent

	Yellowstone (N=96)	Gravelly (N=94)	
Scenery	24.0%	18.1%	
Snow	11.5%	28.7%	
Wildlife	33.3%	0.0%	
Few People	0.0%	9.6%	
Open Country	2.1%	22.3%	
Other	29.2%	21.3%	
Chi-Square	Value	DF	Significance
	65.65	5	.00000

Survey participants were asked to identify the most dissatisfying aspect of their snowmobile trip (Table 21). Results indicate that there is a significant difference between the two samples on this variable. The two most common dissatisfying aspects for the Yellowstone respondents were the trail conditions and crowding. This dissatisfaction with trail conditions is primarily referring to the main road into and out of the Park; due to weather conditions and use levels, this portion of the road becomes very rough at times giving snowmobile users a bumpy ride. Approximately 14% of the respondents reported crowding as the most dissatisfying aspect of their trip.

One-quarter of the Yellowstone respondents reported no dissatisfaction with their trip. In contrast, more than half (55%) of the Gravelly sample reported no dissatisfaction. The weather was the single most mentioned dissatisfying aspect for the Gravelly users. In general, the Gravelly users appear to experience fewer dissatisfying experiences than the Yellowstone visitors. However, reasons for this disparity may be confounded by the fact that the Gravelly users are more experienced riders and are more familiar with what to expect from the area. The *other* category consists of aspects, such as, noise, fumes, and fuel availability.

	Yellowstone (N=85)	Gravelly (N=96)	
Trail Conditions	25.9%	8.3%	
Crowding	14.1%	3.1%	
Noise	7.1%	0.0%	
Weather	8.2%	14.6%	
Other	18.8%	18.8%	
None	25.9%	55.2%	
Chi-Square	Value	DF	Significance
	32.65	5	.00000

Results did not indicate a significant difference in average number of nights stayed between the two samples (Table 22). However, two-thirds of the Gravelly respondents and 3% of the Yellowstone respondents were local residents and thus were omitted from this test. The mean number of nights stayed was 3.8 for the Yellowstone sample and 5 nights for the Gravelly sample.

	Yellowstone (N=24)	Gravelly (N=96)	<u>Significance</u>
Mean	3.8	5.0	.3422
Standard Deviation	2.3	4.1	

Survey participants were asked to report the number of hours they spent riding within either Yellowstone National Park or the Gravelly Mountains (Table 23). A significant difference in the mean hours was found between the two samples. The Gravelly visitors tend to spend significantly more hours riding within the area they visited compared to the time the Yellowstone visitors spent in the Park. The Yellowstone respondents spent an average of 8 hours riding in the Park, while the Gravelly respondents spent an average of nearly 10 hours in the Gravelly Mountains.

	Yellowstone (N=98)	Gravelly (N=99)	<u>Significance</u>
Mean	8.1	9.9	.0001
Standard Deviation	7.6	5.7	

Approximately two-thirds of the Gravelly sample did not snowmobile outside of this mountain range on their trip (Table 24). These use patterns seem to suggest that the Gravelly Mountains tend to satisfy the current needs of most of the visitors. In contrast, approximately 62% of the Yellowstone sample reportedly did snowmobile into nearby forests. In general, the data suggests that a majority of the Yellowstone respondents complemented their Park visit by snowmobile riding in nearby forests, primarily in the Gallatin and Targhee National Forests. The Yellowstone respondents spent an average of approximately 17 hours snowmobile riding in areas outside of the Park and the Gravelly respondents spent an average of 24 hours snowmobile riding outside of the Gravelly Mountains.

	Yellowstone (N=73)	Gravelly (N=42)	<u>Significance</u>
Mean	17.3	24.0	.0791
Standard Deviation	16.7	37.5	

Reasons for Visiting

Study results indicate that snowmobile users in Yellowstone and the Gravelly's differ significantly on their reasons for visiting the area they chose (Table 25). A significant difference was identified on 17 of the 23 reasons that were measured. The reasons that received the highest combined mean score were: to have fun, for the adventure, and to observe the scenic beauty. Other important reasons, included being in a natural setting and doing things with my companions. The reasons with the lowest mean were: to be with and observe other people, for a chance to have control over things, and so my mind can move at a slower pace.

Several variables stood out in this analysis and indicated a significant difference between the samples based on their reasons for visiting. In general, the Yellowstone respondents rated seeing wildlife in its natural habitat significantly higher than the Gravelly users. The Gravelly respondents rated several reasons significantly higher, including: to get away from crowds, for a chance to be on my own, to be at a place where I can make my own decisions, to be unconfined by rules and regulations, for the challenge, and to develop my skills. These reasons were very important to the Gravelly respondents and suggest that the social and managerial setting plays a critical role in determining why visitors chose to visit the Gravelly's. Comparatively, the Yellowstone respondents placed a higher degree of importance on the physical setting.

Table 25 Reason for Visiting by Location

Reasons	Yellowstone	Gravelly	St. Dev.	Significance
	Mean	Mean		
to observe scenic beauty	5.24	4.88	1.03	.0142
for a chance to be on my own	2.83	4.36	1.59	.0000
to be in a natural setting	4.79	4.69	1.20	.5438
to experience tranquillity here	4.50	4.52	1.33	.9362
to make my own decisions	3.01	4.30	1.58	.0000
to do things with my companions	4.60	5.16	1.13	.0005
to enjoy the smells and sounds of nature	4.43	4.18	1.46	.2247
to understand the natural world better	3.94	3.59	1.53	.1052
so my mind can move at a slower pace	3.14	3.31	1.69	.4746
to be with and observe other people	4.39	4.93	1.67	.0010
to learn more about nature	3.59	3.02	1.63	.0156
for the solitude	3.51	3.85	1.70	.1565
for a chance to have control over things	2.31	3.35	1.71	.0000
to view wildlife in its natural habitat	5.22	3.77	1.39	.0000
to be with other who enjoy the same things I do	2.37	3.17	1.43	.0091
to help reduce built up tension	3.59	4.13	1.68	.0234
to get away from the crowds	3.51	4.92	1.47	.0000
to be unconfined by rules and regulations	2.74	4.61	1.65	.0000
to develop my skills and abilities	3.10	4.71	1.53	.0000
to escape the daily responsibilities of life	3.77	4.50	1.67	.0023
for adventure	4.70	5.35	1.05	.0000
to have fun	5.29	5.64	.715	.0006
because I thought it would be a challenge	3.64	4.97	1.48	.0000

Survey respondents were also asked to report the most important reason for visiting. Results indicate a significant difference in reasons for visiting each of the two areas (Table 26). The Yellowstone respondents reported that the scenery, seeing Yellowstone National Park in the winter, and the wildlife were the most important reasons for visiting the Park. The Gravelly respondents were primarily concerned with the openness of the landscape, seeing few people, and the snow conditions. These results lend support to the notion that the Park is of more concern to the Yellowstone visitors than the actual snowmobile riding. Just the opposite may be true for the Gravelly visitors; the availability of wide open spaces, good snow

condition, and few people are attributes that suggest that the snowmobile participation is of central interest to these users.

Table 26 Reason for Visiting Area by Location, in Percent

	Yellowstone (N=100)	Gravelly (N=98)		
Scenery	23.0%	11.2%		
Snow	9.0%	13.3%		
Terrain	3.0%	7.1%		
Proximity	6.0%	8.2%		
Wildlife	12.0%	1.0%		
See Park	19.0%	0.0%		
Few People	0.0%	8.2%		
Open Country	0.0%	23.5%		
Other	28.0%	27.6%		
Chi-Square	Value	DF	Significance	
	66.16	8	.00000	

Chapter 5

TEST OF HYPOTHESES

The purpose of this chapter is to present the results of the hypotheses testing. Four hypotheses are discussed in this section and the results of this testing represents the central goals of this study. These hypotheses explore the linkage between recreation activities, recreation experiences, and recreation settings. Each hypothesis will be briefly reviewed and the results of the testing will be stated. Following each hypothesis will be a discussion of the analysis used to arrive at the research results.

Hypothesis One

Hypothesis one stated that there are definable segments of snowmobile users which differ according to the specific experiences they desire. The respondents from this survey were successfully segmented into three distinct segments based on the types of experiences they desire. The three segments were identified as the Group Challenge, Enthusiasts, and Passive Players. Thus, this hypothesis was accepted. The following discussion on the factor and cluster analyses performed on this data provides support for the stated hypothesis.

Identifying Factors

A principal component factor analysis, using a varimax rotation, was performed on the 23 REP scale items in order to ascertain whether a simpler benefit structure existed. This analysis yielded five factors with Eigenvalues larger than 1.0. These five factors explained 67% percent of the variance in the respondents' scoring of these items. The five factors and

the variables which loaded higher than .40 in each factor are shown in Table 27. A Cronbach's Alpha procedure was performed on each factor scale and indicated acceptable reliability (Table 27).

In general, when two variables loaded on more than one factor, the variable was placed in the factor on which it loaded the highest, but each variable was also scrutinized for conceptual consistency with both the factors in which it loaded. Four expected benefit variables loaded higher than .40 on more than one factor. The variable *solitude* loaded .64 on factor one and .44 on factor two, thus this variable was placed in factor one. The variable *slowpace* loaded .50 on factor one and .61 on factor three; this variable was placed in factor three. The variable *control* loaded at .60 on factor two and .47 on factor three and was placed in factor two. The variable *challenge* loaded .46 on factor two and .81 on factor five and thus was placed with factor five.

Once a decision on the placement of the variables had been made, a scale was created for each factor by summing the importance ratings of each variable in the factor and dividing by the number of variables. Each of the five factors was then given a name which reflected the characteristics of the variables in the factor. Factor one measured the importance attached to appreciating and learning about nature and was thus labeled *Nature Appreciation*. Factor two was labeled *Autonomy*; this factor concerned the respondents desire to be on their own, to have control over things, and to develop their skills. Factor three was called *Tension Release*, which reflected the respondents need to escape the pressure and tension of daily life. Factor four reflected the visitors desire for adventure and challenge, thus this factor was called *Challenge*. The fifth factor is *Affiliation* and is concerned with peoples desire for companionship.

Table 27 Varimax Rotated Factor Loadings for the Experience Variables

	Nature Appreciation	Autonomy	Tension Release	Challenge	Affiliation
SCENERY	.75915				
NAT_SET	.81025				
TRANQUIL	.81530				
SMELL	.72836				
UNDERSTD	.77838				
LEARN	.72003				
SOLITUDE	.64003	44387			
WILDLIFE	.62531				
ON_OWN		.73114			
DECISION		.70106			
CONTROL		.60183	.46910		
CROWDS		.66001			
UNCONFIN		.70503			
SKILLS		.61425			
SLOWPACE	.49583		.60629		
OTHERS			.61615		
TENSION			.71738		
ESCAPE			.65465		
ADVENTUR				.74199	
FUN				.83893	
CHALLGE		.45770		48741	
COMPANIO					.77486
W OTHERS					.81158
Chronbach's Alpha	.886	.859	.755	.692	.702

Identifying Clusters

A k-means cluster procedure was performed for cluster sizes of two, three, and four clusters. For this analysis, cases were included pairwise. The analysis using four clusters was rejected because of a limited sample size in one of the cluster groups. Since the sample size was insufficient at four clusters there was no need to move to a five cluster analysis. The

choice was thus narrowed to either two or three clusters. For both of these cluster analyses, the between means and within means distance ratio was calculated (Table 28). The three cluster procedure resulted in the largest ratio, indicating this to be the optimal number of clusters. The two and three cluster analyses were also examined to determine which procedure provided the most meaningful differences in the factor scale scores. Three clusters were chosen for further analysis resulting from this process.

	Between	Within	Ratio
2 - CLUSTERS	3.17	1.94	1.63
3 - CLUSTERS	3.21	1.76	1.82

Cluster one included 40% of the sample and was termed *Group Challenge* because these respondents scored high on both the *affiliation* and *challenge* factors, but lower on the other three (Table 29). Cluster two was labeled *Enthusiasts* because these respondents scored high on all five factors. The *Enthusiast* cluster constitutes another 40% of the cases and suggests that these individuals are motivated by many aspects of the snowmobile experience. The third cluster, representing 20% of the cases, was called the *Passive Players*. These respondents reported a moderate score on the *challenge* factor, but scored low on the remaining four factors. This group does not appear to be highly motivated by the snowmobile aspect of their trip.

 Table 29 Cluster groups and the variable means are shown for each cluster size

CLUSTER #	NATURE	AUTONOMY	TENS_REL	CHALLENG	AFFILIAT
Group Type (Number of Cases)					
2 - CLUSTERS					
Passive Players (91 Cases)	3.7097	2.5611	2.5778	4.3516	4.1611
Enthusiasts (110 Cases)	4.6678	4.5463	4.2616	5.4091	5.2778
3 - CLUSTERS					
Group Challenge (80 Cases)	3.8984	3.1333	3.0156	4.7375	5.1063
Enthusiasts (80 Cases)	4.8462	4.8761	4.6122	5.5083	5.3141
Passive Players (41 Cases)	3.7031	2.2625	2.2813	4.1789	3.0375

Hypothesis Two

Hypothesis two stated that the physical, social, and managerial setting preferences differ among snowmobile users desiring different types of experiences. Thus, it was hypothesized that the three benefit segments would significantly differ on their desired setting attributes. Acceptance or rejection of this hypothesis is more subjective than for hypothesis one. There is not just a single test to determine if a significant difference exists, but 28 separate tests; one test for each site attribute in the survey. Because some of the tests

indicated a significant difference and others did not, the decision on this hypothesis was based on the overall pattern of these test results.

Significant differences between the Yellowstone and Gravelly respondents were found for 11 of the 28 preferred recreational site attributes. However, 4 of the tests which indicated a significant difference were questionable due to a problem of small cell size. Thus, this hypothesis was not accepted based on the overall pattern of the data. The following sections discuss the reliability of benefit segments as a predictor of setting attribute preferences.

Physical Setting Attributes

There was not a statistically significant difference between the three benefit segments on the importance of seeing some wildlife (Table 30). In general, the majority of the individuals in each of the three groups identified this as a very or extremely important part of their snowmobile trip. The Enthusiasts had the highest proportion of respondents who felt that this was extremely important, with nearly 35%. Overall, less than 10% of all the respondents felt that seeing some wildlife was not at all important.

Table 30 Importance of Seeing Some Wildlife by Benefit Segments, in Percent

	Group Challenge (N=80)	Enthusiasts (N=80)	Passive Players (N=41)
Not at all Important	8.9%	6.4%	7.3%
Slightly Important	11.4%	7.7%	4.9%
Somewhat Important	15.2%	7.7%	14.6%
Moderately Important	13.9%	19.2%	17.1%
Very Important	31.6%	24.4%	31.7%
Extremely Important	19.0%	34.6%	24.4%
Chi-Square	Value	DF	Significance
	9.1	10	.5204

The attribute, seeing a lot of wildlife, is similar to the previous attribute, seeing some wildlife (Table 31). This question was asked to see if there was a discernible difference in responses from the visitors regarding the volume of wildlife sightings. The results of this analysis did not indicate any significant difference among benefit segments on this attribute. In addition, the general pattern of the responses to both of these questions was very similar.

Table 31 Importance of Seeing A Lot of Wildlife by Benefit Segments, in Percent

	Group Challenge (N=79)	Enthusiasts (N=78)	Passive Players (N=40)
Not at all Important	15.2%	11.5%	15.0%
Slightly Important	13.9%	11.5%	7.5%
Somewhat Important	10.1%	16.7%	7.5%
Moderately Important	15.2%	17.9%	12.5%
Very Important	17.7%	19.2%	30.0%
Extremely Important	27.8%	23.1%	27.5%
Chi-Square	Value	DF	Significance
	6.66	10	.7568

Results indicate that there is a statistically significant difference between the three benefit segments on the importance of scenic overlooks (Table 32). However, the validity of the test is questionable because 39% of the cells have an expected value of less than 5. Nearly 50% of the Enthusiasts felt that scenic overlooks were extremely important, moreover, about 75% of this group felt they were at least very important. Scenic overlooks were also important for the other segments; more than half of the respondents in the Group Challenge and Passive Players clusters stated that scenic overlook were very or extremely important. Very few respondents felt that this was not an important site attribute.

Table 32 Importance of Scenic Overlooks by Benefit Segments, in Percent

	Group Challenge (N=80)	Enthusiasts (N=78)	Passive Players (N=41)
Not at all Important	5.0%	2.6%	0.0%
Slightly Important	2.5%	2.6%	4.9%
Somewhat Important	13.8%	3.8%	7.3%
Moderately Important	16.3%	15.4%	29.3%
Very Important	42.5%	26.9%	31.7%
Extremely Important	20.0%	48.7%	26.8%
Chi-Square	Value	DF	Significance
	24.14	10	.0072

A significant difference was found between benefit segments on the importance placed on untracked open meadows (Table 33). A note of caution must be mentioned here though; 28% of the cells had an expected value of less than 5. Open meadows appeared to be most important for the Enthusiasts, with 58% rating this attribute as extremely important. However, a majority of participants in the other two clusters also find this attribute at least moderately important. Thus, overall the presence of untracked open meadows appears to be a desirable attribute.

Table 33 Importance of Untracked Open Meadows by Benefit Segments, in Percent

	Group Challenge (N=80)	Enthusiasts (N=78)	Passive Players (N=41)
Not at all Important	0.0%	0.0%	7.3%
Slightly Important	12.5%	2.6%	2.4%
Somewhat Important	7.5%	5.1%	17.1%
Moderately Important	21.3%	17.9%	19.5%
Very Important	23.8%	16.7%	22.0%
Extremely Important	35.0%	57.7%	31.7%
Chi-Square	Value	DF	Significance
	31.03	10	.0006

The benefit segments did not differ significantly on the reported degree of importance of viewing water while snowmobiling (Table 34). Responses to this question were distributed fairly well across the range of values. The Enthusiasts were the least likely to report seeing water as very or extremely important. The large majority of respondents in all cases indicated that this attribute was moderately important or less.

Table 34 Importance of Viewing Water by Benefit Segments, in Percent

	Group Challenge (N=79)	Enthusiasts (N=78)	Passive Players (N=41)
Not at all Important	22.8%	24.4%	22.0%
Slightly Important	15.2%	17.9%	14.6%
Somewhat Important	16.5%	17.9%	22.0%
Moderately Important	22.8%	20.5%	17.1%
Very Important	17.7%	7.7%	7.3%
Extremely Important	5.1%	11.5%	17.1%
Chi-Square	Value	DF	Significance
	9.56	10	.4802

The segments did not differ on the importance they attached to seeing unique geological features (Table 35). In general, this was a fairly important setting attribute to all the groups. Close to half of the participants in each group reported these features as at least very important. Few of the respondents rated seeing these features as not at all important.

 Table 35 Importance of Unique Geological Features by Benefit Segments, in Percent

	Group Challenge (N=80)	Enthusiasts (N=80)	Passive Players (N=41)
Not at all Important	2.5%	10.3%	7.5%
Slightly Important	10.1%	7.7%	10.0%
Somewhat Important	13.9%	14.1%	12.5%
Moderately Important	25.3%	14.1%	20.0%
Very Important	32.9%	24.4%	22.5%
Extremely Important	15.2%	29.5%	27.5%
Chi-Square	Value	DF	Significance
	11.75	10	.3022

The importance of having dry, cold snow conditions was found to be significantly different between the clusters (Table 36). However, caution is noted for these results, because 22% of the cells had expected frequencies of less than 5. The Enthusiasts tended to stand out from the other two clusters in that they were more likely to rate the snow conditions as very or extremely important and less likely to report them as not at all important. Aside from this proportional difference the overall pattern of the data is the same for all three clusters. The majority of all three groups tended to report the snow conditions as at least moderately important. The Passive Players had the highest proportion of respondents indicate that this was not at all important, but overall the every group noted this as a fairly important setting attribute.

Table 36 Importance of Dry, Cold Snow Conditions by Benefit Segments, in Percent

	Group Challenge (N=78)	Enthusiasts (N=78)	Passive Players (N=40)
Not at all Important	6.4%	2.6%	17.5%
Slightly Important	5.1%	5.1%	7.5%
Somewhat Important	15.4%	7.7%	17.5%
Moderately Important	38.5%	26.9%	22.5%
Very Important	16.7%	30.8%	20.0%
Extremely Important	17.9%	26.9%	15.0%
Chi-Square	Value	DF	Significance
	20.06	10	.0287

Results indicated a significant difference between the segments based on the importance of viewing mountains while snowmobiling (Table 37). However, these results are highly questionable because 39% of the cells had expected frequencies of less than 5. The overall pattern of the data is fairly consistent among the groups. Few respondents reported these views as not important or only slightly important. The overwhelming majority of respondents felt that viewing mountains was at least moderately important. These views appeared to be most important for the Enthusiasts, as 88% felt that the mountains were at least very important.

Table 37 Importance of Viewing Mountains by Benefit Segments, in Percent

	Group Challenge (N=79)	Enthusiasts (N=78)	Passive Players (N=40)
Not at all Important	0.0%	1.3%	2.5%
Slightly Important	0.0%	1.3%	2.5%
Somewhat Important	3.8%	5.1%	15.0%
Moderately Important	22.8%	3.8%	20.0%
Very Important	31.6%	34.6%	22.5%
Extremely Important	41.8%	53.8%	37.5%
Chi-Square	Value	DF	Significance
	22.70	10	.0119

A statistically significant difference was found between the benefit segments based on the importance of having forested areas thinned by logging (Table 38). While this is a management option primarily subject to only the National Forest lands, the measure was used in both surveys for comparative purposes. Overall, little importance was placed on this setting attribute. The most frequent response for all three groups was not at all important. The main difference appears to be with the Enthusiasts. The Enthusiasts were less likely to report thinning to be not at all important or slightly important and more likely to report it as moderately or very important.

Table 38 Forested Areas Thinned by Logging by Benefit Segments, in Percent

	Group Challenge (N=78)	Enthusiasts (N=78)	Passive Players (N=40)
Not at all Important	38.5%	29.5%	40.0%
Slightly Important	24.4%	15.4%	25.0%
Somewhat Important	23.1%	10.3%	10.0%
Moderately Important	5.1%	25.6%	10.0%
Very Important	3.8%	12.8%	7.5%
Extremely Important	5.1%	6.4%	7.5%
Chi-Square	Value	DF	Significance
	24.50	10	.0064

The benefit segments did not differ on the importance placed on clearcuts in forested areas (Table 39). While the potential for clearcuts only really exists on National Forest lands rather than in Yellowstone National Park, the question was asked in both locations for comparison of attitudes among visitors. Close to 30% of the respondents in each cluster felt that clearcuts were not at all important to their snowmobiling activities. The remaining participants were more variable in the level of importance they reported.

Table 39 Importance of Clearcuts in Forested Areas by Benefit Segments, in Percent

	Group Challenge (N=79)	Enthusiasts (N=78)	Passive Players (N=41)
Not at all Important	27.8%	29.5%	34.1%
Slightly Important	15.2%	16.7%	7.3%
Somewhat Important	24.1%	9.0%	17.1%
Moderately Important	11.4%	12.8%	7.3%
Very Important	16.5%	17.9%	19.5%
Extremely Important	5.1%	14.1%	14.6%
Chi-Square	Value	DF	Significance
	12.19	10	.2726

The importance of having looped trails did not differ significantly between the clusters (Table 40). Overall, a majority of the sample indicated that looped trails were at least moderately important to their snowmobiling. Responses to this attribute were fairly well distributed across the scale, but responses for the somewhat and moderately important ratings tended to be the most frequent. In general, the respondents placed a moderate degree of importance on this setting attribute.

Table 40 Importance of Looped Trails

	Group Challenge (N=79)	Enthusiasts (N=78)	Passive Players (N=40)
Not at all Important	11.4%	12.8%	17.5%
Slightly Important	7.6%	10.3%	12.5%
Somewhat Important	19.0%	23.1%	20.0%
Moderately Important	35.4%	21.8%	15.0%
Very Important	15.2%	15.4%	22.5%
Extremely Important	11.4%	16.7%	12.5%
Chi-Square	Value	DF	Significance
	8.77	10	.5539

There was not a significant difference among the groups on the importance of having long trails (Table 41). However, the Enthusiasts were more likely to rate long trails as being extremely important. A majority of the respondents reported that this was at least moderately important to their trip, while approximately one-third felt it was only somewhat important.

	Group Challenge (N=79)	Enthusiasts (N=78)	Passive Players (N=41)
Not at all Important	11.4%	10.3%	12.2%
Slightly Important	8.9%	9.0%	9.8%
Somewhat Important	22.8%	10.3%	22.0%
Moderately Important	17.7%	20.5%	14.6%
Very Important	19.0%	14.1%	19.5%
Extremely Important	20.3%	35.9%	22.0%
Chi-Square	Value	DF	Significance
	9.42	10	.4929

Social Setting Attributes

A significant difference was found between the benefit segments based on the importance they attached to not seeing other people while snowmobiling (Table 42). The Enthusiasts stand out from the other two segments on this attribute. Over 80% of the Enthusiasts felt that this was at least moderately important and 36% felt it was extremely important. The Group Challenge and Passive Players were more variable in their assessment of importance. The Passive Players had the largest proportion (22%) who felt it was not at all important.

Table 42 Importance of Not Seeing Other People by Benefit Segments, in Percent

	Group Challenge (N=80)	Enthusiasts (N=78)	Passive Players (N=41)
Not at all Important	12.5%	9.0%	22.0%
Slightly Important	7.5%	6.4%	14.6%
Somewhat Important	30.0%	3.8%	19.5%
Moderately Important	17.5%	26.9%	14.6%
Very Important	21.3%	17.9%	12.2%
Extremely Important	11.3%	35.9%	17.1%
Chi-Square	Value	DF	Significance
	36.53	10	.0001

There is a significant difference among the benefit segments on the importance of there being little evidence of previous visitors (Table 43). The most apparent difference is that 31% of the Enthusiasts reported this as an extremely important condition, close to three times as many in the other two segments. The Passive Players tend to find this attribute less important than other benefit segments and they had the greatest proportion of responses indicating that this was not at all important. More than half of the Group Challenge and Enthusiasts thought that little evidence of previous visitors was at least moderately important.

Table 43 Importance of Little Evidence of Previous Visitors by Segments, in Percent

	Group Challenge (N=80)	Enthusiasts (N=78)	Passive Players (N=41)
Not at all Important	10.0%	5.1%	19.5%
Slightly Important	10.0%	10.3%	7.3%
Somewhat Important	27.5%	14.1%	29.3%
Moderately Important	22.5%	20.5%	19.5%
Very Important	18.8%	19.2%	12.2%
Extremely Important	11.3%	30.8%	12.2%
Chi-Square	Value	DF	Significance
	20.11	10	.0282

The three benefit segments are significantly different on the importance they place on seeing others involved in motorized recreation (Table 44). The Passive Players had a significantly higher proportion of participants, at 59%, respond that this was not at all important. The Enthusiasts placed the highest degree of importance on seeing others involved in motorized recreation, but even this support was limited. In general, none of the groups appear to place a great deal of importance on this attribute.

Table 44 Importance of Seeing Others Involved in Motorized Recreation, in Percent

	Group Challenge (N=79)	Enthusiasts (N=78)	Passive Players (N=41)
Not at all Important	30.4%	26.9%	58.5%
Slightly Important	19.0%	5.1%	22.0%
Somewhat Important	17.7%	12.8%	9.8%
Moderately Important	19.0%	28.2%	4.9%
Very Important	10.1%	11.5%	4.9%
Extremely Important	3.8%	15.4%	0.0%
Chi-Square	Value	DF	Significance
	37.00	10	.0007

The importance of seeing others involved in non-motorized recreation was not significantly different between the benefit segments (Table 45). The majority of respondents in each group indicated that this was not important to their snowmobile trip. The validity of this chi square test is highly questionable due to the fact that nearly 40% of the cells had expected values of less than 5. However, in practical terms the data strongly suggests that this is not an important attribute to any of the three benefit segments.

Table 45 Importance of Seeing Others Involved in Non-Motorized Recreation by Benefit Segments, in Percent

	Group Challenge (N=79)	Enthusiasts (N=78)	Passive Players (N=40)
Not at all Important	50.6%	53.8%	60.0%
Slightly Important	24.1%	10.3%	15.0%
Somewhat Important	16.5%	11.5%	7.5%
Moderately Important	3.8%	14.1%	10.0%
Very Important	3.8%	2.6%	2.5%
Extremely Important	1.3%	7.7%	5.0%
Chi-Square	Value	DF	Significance
	15.21	10	.1245

Managerial Setting Attributes

No significant difference was found between the groups based on the importance of nature interpretation along the trail (Table 46). Approximately 25% of the sample (slightly less for the Enthusiasts) felt that nature interpretation was not at all important. A majority of the respondents stated that it was slightly important to moderately important. Few of the participants rated nature interpretation as very or extremely important. In general, nature interpretation does not appear to be of great importance to any of the benefit segments.

Table 46 Importance of Nature Interpretation by Benefit Segments, in Percent

	Group Challenge (N=79)	Enthusiasts (N=78)	Passive Players (N=41)
Not at all Important	24.1%	19.2%	24.4%
Slightly Important	19.0%	17.9%	14.6%
Somewhat Important	24.1%	16.7%	17.1%
Moderately Important	24.1%	26.9%	24.4%
Very Important	6.3%	10.3%	7.3%
Extremely Important	2.5%	9.0%	12.2%
Chi-Square	Value	DF	Significance
	7.24	10	.7030

There was no significant difference between the benefit segments regarding their attitudes on the importance of the area being regularly patrolled by rangers (Table 47). In general, most of the visitors placed little importance on this management attribute. Overall, having the area patrolled by rangers was least important for the Group Challenge segment.

Table 47 Importance of Area Patrolled by Rangers by Benefit Segments, in Percent

	Group Challenge (N=79)	Enthusiasts (N=78)	Passive Players (N=41)
Not at all Important	54.4%	48.7%	43.9%
Slightly Important	16.5%	17.9%	12.2%
Somewhat Important	11.4%	11.5%	14.6%
Moderately Important	11.4%	10.3%	19.5%
Very Important	5.1%	5.1%	4.9%
Extremely Important	1.3%	6.4%	4.9%
Chi-Square	Value	DF	Significance
	6.11	10	.8056

No significant difference was found among benefit segments based on the importance of having emergency help available throughout the area (Table 48). This does not appear to be a highly important management function for most of the participants. The most notable exception is the Passive Players; nearly one-third of the respondents in this group felt that this was at least moderately important. However, more the 20% of the snowmobile users in each group felt that emergency help was not at all important. The lack of importance placed on this attribute may be influenced by the fact that the snowmobile riders in this study generally tended to ride in large groups and were able to rely on their companions for aid.

Table 48 Importance of Emergency Help Available by Benefit Segments, in Percent

	Group Challenge (N=79)	Enthusiasts (N=78)	Passive Players (N=41)
Not at all Important	21.5%	20.5%	24.4%
Slightly Important	12.7%	15.4%	9.8%
Somewhat Important	26.6%	17.9%	17.1%
Moderately Important	15.2%	16.7%	31.7%
Very Important	17.7%	12.8%	9.8%
Extremely Important	6.3%	16.7%	7.3%
Chi-Square	Value	DF	Significance
	12.77	10	.2367

The benefit segments were not found to be significantly different on the trail markers attribute (Table 49). The majority of participants in each segment indicated that trail markers were very important or extremely important to their snowmobile trip. Very few users reported this attribute as not at all important. Thus, there is strong support for the conclusion that trail markers are an important management action that directly effects snowmobile participation.

Table 49 Importance of Trail Markers by Benefit Segments, in Percent

	Group Challenge (N=79)	Enthusiasts (N=78)	Passive Players (N=41)
Not at all Important	3.8%	10.3%	12.2%
Slightly Important	2.5%	5.1%	0.0%
Somewhat Important	13.9%	7.7%	9.8%
Moderately Important	16.5%	16.7%	9.8%
Very Important	36.7%	21.8%	31.7%
Extremely Important	26.6%	38.5%	36.6%
Chi-Square	Value	DF	Significance
	12.84	10	.2330

The importance of having a supply of maps was not significantly different among the benefit segments (Table 50). The majority of respondents in all three segments felt that a

supply of maps was at least moderately important. The Group Challenge segment was the least likely to report these maps as being not at all important or slightly important.

Table 50 Importance of A Supply of Maps by Benefit Segments, in Percent

	Group Challenge (N=79)	Enthusiasts (N=78)	Passive Players (N=40)
Not at all Important	6.3%	15.4%	15.0%
Slightly Important	5.1%	11.5%	12.5%
Somewhat Important	22.8%	10.3%	20.0%
Moderately Important	20.3%	23.1%	20.0%
Very Important	29.1%	18.2%	17.5%
Extremely Important	16.5%	20.5%	15.0%
Chi-Square	Value	DF	Significance
	12.52	10	.2521

A statistically significant difference was found between the clusters according to the reported importance of having plowed parking areas (Table 51). The main difference appears to be that the Passive Players tended to report plowed parking to be less important than the other two groups did. Overall, the majority of users in all three segments reported plowed parking areas as at least moderately important.

Table 51 Importance of Plowed Parking Areas by Benefit Segments, in Percent

	Group Challenge (N=79)	Enthusiasts (N=78)	Passive Players (N=40)
Not at all Important	6.3%	12.8%	17.5%
Slightly Important	11.4%	5.1%	25.0%
Somewhat Important	5.1%	20.5%	15.0%
Moderately Important	31.6%	14.1%	20.0%
Very Important	29.1%	21.8%	17.5%
Extremely Important	16.5%	25.6%	5.0%
Chi-Square	Value	DF	Significance
	33.19	10	.0003

A significant difference between benefit segments was found based on their perceived importance of groomed trails (Table 52). Groomed trails were most important for the Passive Players; 56% of this group felt that groomed trails were very important or extremely important. However, groomed trails appeared to be fairly important for all three segments. The majority of all the respondents reported this attribute to be at least moderately important. The Enthusiasts were the most likely to report groomed trails as not at all important.

Table 52 Importance of Groomed Trails by Benefit Segments, in Percent

	Group Challenge (N=79)	Enthusiasts (N=78)	Passive Players (N=41)
Not at all Important	12.7%	20.5%	9.8%
Slightly Important	7.6%	11.5%	7.3%
Somewhat Important	19.0%	11.5%	17.1%
Moderately Important	26.6%	19.2%	9.8%
Very Important	25.3%	9.0%	31.7%
Extremely Important	8.9%	28.2%	24.4%
Chi-Square	Value	DF	Significance
	25.35	10	.0047

There was no statistical difference between the segments based on the importance of heated shelters in the parking area (Table 53). The majority of the participants found this attribute to be not important. Very few snowmobile users found this to be very or extremely important. In general, there appears to be little interest in having these types of shelters.

Table 53 Importance of Heated Shelters in Parking Area by Benefit Segments, in Percent

	Group Challenge (N=79)	Enthusiasts (N=78)	Passive Players (N=40)
Not at all Important	48.1%	64.1%	50.0%
Slightly Important	16.5%	9.0%	22.5%
Somewhat Important	7.6%	9.0%	12.5%
Moderately Important	15.2%	9.0%	7.5%
Very Important	6.3%	3.8%	5.0%
Extremely Important	6.3%	5.1%	2.5%
Chi-Square	Value	DF	Significance
	9.51	10	.4843

The degree of importance placed on having outhouses along the trail was not significantly different among the benefit segments (Table 54). Few of the respondents indicated that outhouses were very important or extremely important, 10% or less for each of these importance ratings, while 30% or more of the respondents reported that outhouses were not at all important. Overall, having outhouses along the trail was not of major importance to most users, however, one exception is that nearly 33% of the Passive Players thought that the outhouses were moderately important.

Table 54 Importance of Outhouses Along the Trail by Benefit Segments, in Percent

	Group Challenge (N=78)	Enthusiasts (N=78)	Passive Players (N=40)
Not at all Important	30.8%	37.02%	30.0%
Slightly Important	21.8%	15.4%	2.5%
Somewhat Important	15.4%	15.4%	15.0%
Moderately Important	20.5%	15.4%	32.5%
Very Important	7.7%	9.0%	10.0%
Extremely Important	3.8%	7.7%	10.0%
Chi-Square	Value	DF	Significance
	12.69	10	.2417

There is no significant difference between segments based on the importance of having small open shelters along the trail (Table 55). This did not appear to be a highly important attribute among any of the segments. The Enthusiasts were the most likely to rate these shelters as not at all important, with 36%. Few of the participants felt that these shelters were very or extremely important. Roughly two-thirds of the sample indicated that this attribute was only somewhat important or less.

Table 55 Importance of Small Open Shelters Along Trail by Benefit Segments, in Percent

	Group Challenge (N=79)	Enthusiasts (N=78)	Passive Players (N=41)
Not at all Important	21.5%	35.9%	26.8%
Slightly Important	15.2%	17.9%	26.8%
Somewhat Important	25.3%	14.1%	19.5%
Moderately Important	19.0%	12.8%	22.0%
Very Important	13.9%	11.5%	4.9%
Extremely Important	5.1%	7.7%	0.0%
Chi-Square	Value	DF	Significance
	14.12	10	.1674

A statistically significant difference was found among the segments based on the importance of having warming huts along the trail (Table 56). However, this test is questionable because 28% of the cells had an expected value of less than 5. Most of these small cells were at the high end of the scale. In practical terms, warming huts do not seem to be very important. The Enthusiasts were the most likely to feel that the huts were not at all important and the Passive Players were more likely to rate the huts as somewhat important.

Table 56 Importance of Warming Huts Along the Trail by Benefit Segments, in Percent

	Group Challenge (N=79)	Enthusiasts (N=78)	Passive Players (N=40)
Not at all Important	27.8%	41.0%	17.5%
Slightly Important	25.3%	15.4%	20.0%
Somewhat Important	12.7%	20.5%	32.5%
Moderately Important	11.4%	9.0%	15.0%
Very Important	15.2%	6.4%	15.0%
Extremely Important	7.6%	7.7%	0.0%
Chi-Square	Value	DF	Significance
	7.6	10	.0360

The degree of importance placed on public cabins did not significantly differ between the benefit segments (Table 57). There does not appear to be a high degree of importance attached to this setting attribute among any of the segments. A majority of respondents overall rated the cabins as not at all important. However, a good proportion of the respondents did place some importance on the presence of public cabin. Approximately 40% or more of the sample felt that the cabins were slightly to moderately important.

Table 57 Importance of Public Cabins by Benefit Segments, in Percent

	Group Challenge (N=78)	Enthusiasts (N=78)	Passive Players (N=40)
Not at all Important	39.7%	48.7%	55.0%
Slightly Important	21.8%	11.5%	20.0%
Somewhat Important	12.8%	14.1%	12.5%
Moderately Important	14.1%	12.8%	7.5%
Very Important	5.1%	3.8%	5.0%
Extremely Important	6.4%	9.0%	0.0%
Chi-Square	Value	DF	Significance
	8.74	10	.5568

Hypothesis Three

Hypothesis three stated that the snowmobile users in Yellowstone and the Gravelly Mountains desire different types of experiences. In other words, it is believed that visitors to these two locations seek different experiences and receive different benefits from their participation. Results indicate a significant difference between the Yellowstone and the Gravelly users based on the distribution of the respondents in each benefit cluster (Table 58). Thus, this hypothesis was accepted.

Approximately 40% of both the Yellowstone and Gravelly samples were identified as being in the Group Challenge benefit segment. Slightly more than half (54%) of the Gravelly users were termed Enthusiasts, compared to approximately one-quarter of the Yellowstone respondents. The biggest difference, however, was found with regards to the Passive Players. Only 6% of the Gravelly users were identified as Passive Players. In contrast, just over one-third of the Yellowstone users were identified as Passive Players.

Table 58 Benefits Segments by Location, in Percent

	Yellowstone (N=101)	Gravelly (N=100)	
Group Challenge	39.6%	40.0%	
Enthusiasts	25.7%	54.0%	
Passive Players	34.7%	6.0%	
Chi-Square	Value	DF	Significance
	30.30	2	.00000

Hypothesis Four

Hypothesis four stated that the physical, social, and managerial setting preferences differ among the snowmobile users in Yellowstone and the Gravelly Mountains. The

acceptance or rejection of this hypothesis is similar to hypothesis two. There is not just a single test to determine if a difference exists, but 28 separate tests. Because some of the tests indicated a significant difference and others did not, the decision on this hypothesis was based on the overall pattern of these test results.

Significant differences between the Yellowstone and Gravelly respondents were found for 22 of the 28 preferred setting attributes. One of the tests which indicated a significant difference was questionable due to a problem of small cell size. This hypothesis was accepted based on the overall pattern of the data. The following discussion provides support for the conclusion that there are significant differences in the preferred setting attributes among the respondents in Yellowstone and the Gravelly Mountains.

Physical Setting Attributes

There was a significant difference between the Yellowstone and Gravelly sample on the importance of seeing some wildlife during their trip (Table 59). Close to three-quarters of the Yellowstone sample reported wildlife as very or extremely important. Just over one-third of the Gravelly respondents rated wildlife as at least very important. There were also significantly fewer Yellowstone respondents at the low end of the importance scale. Overall, seeing wildlife is of much greater importance to the Yellowstone visitors.

Table 59 Importance of Seeing Some Wildlife by Location, in Percent

	Yellowstone (N=100)	Gravelly (N=98)	
Not At All Important	1.0%	14.3%	
Slightly Important	2.0%	15.3%	
Somewhat Important	8.0%	16.3%	
Moderately Important	16.0%	17.3%	
Very Important	35.0%	22.4%	
Extremely Important	38.0%	14.3%	
Chi-Square	Value	DF	Significance
	37.93	5	.00000

The attribute, seeing a lot of wildlife, is similar to the previous attribute, seeing some wildlife (Table 60). The results of this analysis indicates that there is a significant difference between the Yellowstone and Gravelly samples on seeing a lot of wildlife. In addition, the data suggest that there is a slight difference in the respondents' reported importance of seeing some wildlife and seeing a lot of wildlife. In general, the Gravelly respondents rated seeing a lot of wildlife as less important than seeing some wildlife. The response pattern for the Yellowstone respondents was basically the same for both attributes.

Table 60 Importance of Seeing A Lot of Wildlife by Location, in Percent

	Yellowstone (N=99)	Gravelly (N=98)	
Not At All Important	2.0%	25.5%	
Slightly Important	5.1%	18.4%	
Somewhat Important	6.1%	18.4%	
Moderately Important	15.2%	16.3%	
Very Important	28.3%	13.3%	
Extremely Important	43.3%	8.2%	
Chi-Square	Value	DF	Significance
	62.48	5	.0000

A statistically significant difference was found between the two samples based on the importance of scenic overlooks, but the data is questionable due to a problem of small cell size (Table 61). Overall, the majority of both group reported scenic overlooks as very important or extremely important. The main difference is that 42% of the Yellowstone sample rated this attribute as extremely important, compared to 23% for the Gravelly sample. Thus, scenic overlooks appear to be slightly more important to the Yellowstone visitors.

Table 61 Importance of Scenic Overlook by Location, in Percent

	Yellowstone (N=100)	Gravelly (N=99)	
Not At All Important	0.0%	6.1%	
Slightly Important	1.0%	5.1%	
Somewhat Important	3.0%	14.1%	
Moderately Important	22.0%	15.2%	
Very Important	32.0%	36.4%	
Extremely Important	42.0%	23.3%	
Chi-Square	Value	DF	Significance
	22.89	5	.0004

The Gravelly respondents reported a significantly higher importance rating on the existence of untracked open meadows (Table 62). Twice as many of the Gravelly respondents, approximately 58%, reported these meadows as extremely important. These results are not surprising given the fact that snowmobile riders are not allowed to go off the road in Yellowstone National Park and thus would likely not find these meadows as important. The Gravelly users by contrast are free to ride anywhere they please, with few restrictions, thus these open meadows are a popular type of terrain.

Table 62 Importance of Untracked Open Meadows by Location, in Percent

	Yellowstone (N=100)	Gravelly (N=99)	
Not At All Important	3.0%	0.0%	
Slightly Important	10.0%	3.0%	
Somewhat Important	15.0%	2.0%	
Moderately Important	25.0%	14.1%	
Very Important	18.0%	23.2%	
Extremely Important	29.0%	57.6%	
Chi-Square	Value	DF	Significance
	29.53	5	.0000

There was a significant difference in the importance of viewing water between the two samples (Table 63). The Gravelly respondents tended to place little importance on viewing water. The majority of these respondents reported this attribute as not at all important or slightly important. Just the opposite is true for the Yellowstone respondents. The majority of the Yellowstone users reported that seeing water was at least moderately important to their trip. These results are likely influenced by the presence of the geysers and sulfur springs in Yellowstone.

Table 63 Importance of Viewing Water by Location, in Percent

	Yellowstone (N=100)	Gravelly (N=98)	
Not At All Important	8.0%	38.8%	
Slightly Important	13.0%	19.4%	
Somewhat Important	17.0%	19.4%	
Moderately Important	29.0%	12.2%	
Very Important	20.0%	3.1%	
Extremely Important	13.0%	7.1%	
Chi-Square	Value	DF	Significance
	42.20	5	.0000

A significant difference between the samples was found regarding the importance of seeing unique geological features (Table 64). The Yellowstone respondents were much more likely to rate these features as very important or extremely important to their trip. In contrast to the Yellowstone sample, the Gravelly respondents were more likely to rate these features as not important to somewhat important. However, the over pattern suggests that both groups felt that seeing unique geological features was an important aspect of their trip.

Table 64 Importance of Unique Geological Features by location, in Percent

	Yellowstone (N=99)	Gravelly (N=98)	
Not At All Important	3.0%	10.2%	
Slightly Important	5.1%	13.3%	
Somewhat Important	9.1%	18.4%	
Moderately Important	20.2%	19.4%	
Very Important	30.3%	24.5%	
Extremely Important	32.3%	14.3%	
Chi-Square	Value	DF	Significance
	18.06	5	.0029

There was no statistical difference between the two samples on the importance of having dry, cold snow conditions (Table 65). Close to three-quarters of the respondents in both the Yellowstone sample and the Gravelly sample reported that this attribute was at least moderately important. Very few of the respondents felt that this was not an important component of their snowmobile trip.

Table 65 Importance of dry, Cold Snow Conditions by Location, in Percent

	Yellowstone (N=98)	Gravelly (N=98)	
Not At All Important	8.2%	6.1%	
Slightly Important	4.1%	7.1%	
Somewhat Important	12.2%	13.3%	
Moderately Important	33.7%	27.6%	
Very Important	22.4%	23.5%	
Extremely Important	19.4%	22.4%	
Chi-Square	Value	DF	Significance
	1.99	5	.8511

There was no significant difference between the samples based on the importance of viewing mountains (Table 66). Close to three-quarters of all the respondents reported that viewing mountains was very important or extremely important to their snowmobile trip. Very few of the respondents felt that this attribute was not at all important or only slightly important. Overall, mountains appear to be important to nearly all of the respondents.

Table 66 Importance of Viewing Mountains by Location, in Percent

	Yellowstone (N=98)	Gravelly (N=99)	
Not At All Important	2.0%	0.0%	
Slightly Important	1.0%	1.0%	
Somewhat Important	8.2%	5.1%	
Moderately Important	17.3%	12.1%	
Very Important	25.5%	36.4%	
Extremely Important	45.9%	45.5%	
Chi-Square	Value	DF	Significance
	5.53	5	.3543

No significant difference between the groups was found based on the importance of having forested areas thinned by logging (Table 67). The majority of all the respondents reported this attribute as being not at all important or slightly important to their snowmobile

trip. Few of the respondents indicated that areas thinned by logging were very important. Overall, this site attribute does not appear to be of great importance to many of the snowmobile riders.

Table 67 Importance of Forested Areas Thinned by Logging by Location, in Percent

	Yellowstone (N=98)	Gravelly (N=98)	
Not At All Important	40.8%	29.6%	
Slightly Important	19.4%	22.4%	
Somewhat Important	14.3%	16.3%	
Moderately Important	11.2%	17.3%	
Very Important	7.1%	9.2%	
Extremely Important	7.1%	5.1%	
Chi-Square	Value	DF	Significance
	3.98	5	.5530

No significant difference was found between the samples based on the importance of clearcuts in forested areas (Table 68). The responses were distributed across the range of the scale, but the majority of the respondents reported clearcuts to be somewhat important or less. Overall, there does appear to be some importance placed on having clearcuts in the area, but support for this attribute is limited.

Table 68 Importance of Clearcuts in Forested Areas by Location, in Percent

	Yellowstone (N=100)	Gravelly (N=98)	
Not At All Important	23.0%	36.7%	
Slightly Important	11.0%	17.3%	
Somewhat Important	19.0%	14.3%	
Moderately Important	13.0%	9.2%	
Very Important	19.0%	16.3%	
Extremely Important	15.0%	6.1%	
Chi-Square	Value	DF	Significance
	9.73	5	.0833

A significant difference between the samples was found based on the importance attached to looped trails (Table 69). The Yellowstone sample had a larger proportion of respondents rate the importance of looped trails as moderately to extremely important, while the Gravelly sample had a larger proportion of respondents rate the importance as not at all to somewhat important. Overall, the majority of all the respondents reported looped trails as at least moderately important to their trip.

Table 69 Importance of Looped trails by Location, in Percent

	Yellowstone (N=99)	Gravelly (N=98)	
Not At All Important	7.1%	19.4%	
Slightly Important	7.1%	12.2%	
Somewhat Important	17.2%	24.5%	
Moderately Important	29.3%	22.4%	
Very Important	23.2%	10.2%	
Extremely Important	16.2%	11.2%	
Chi-Square	Value	DF	Significance
	15.05	5	.0101

There is a significant difference between the samples based on the importance attached to having long trails (Table 70). The main difference is that nearly twice as many Yellowstone visitors, approximately 35%, rated long trails as extremely important. In addition, the Gravelly visitors were much more likely to rate long trails as not at all important or only slightly important. Thus, the overall pattern suggests that the Yellowstone respondents place more importance on having long trails.

Table 70 Importance of Long Trails by Location, in Percent

	Yellowstone (N=100)	Gravelly (N=98)	
Not At All Important	4.0%	18.4%	
Slightly Important	4.0%	14.3%	
Somewhat Important	20.0%	15.3%	
Moderately Important	18.0%	18.4%	
Very Important	19.0%	15.3%	
Extremely Important	35.0%	18.4%	
Chi-Square	Value	DF	Significance
	21.08	5	.0008

Social Setting Attributes

The importance of not seeing other people was significantly different between the sample respondents (Table 71). Nearly one-third of the Gravelly users rated this as extremely important and the majority of this sample felt not seeing other people was at least very important. The Yellowstone respondents were more evenly divided in their opinions about not seeing other people. In general, this was a more important site attribute for the Gravelly respondents than for the Yellowstone respondents. The expectations of the visitor may also play a part in these results. Visitors to Yellowstone are more likely to expect to see others and thus the absence of other people is not likely to be as important of a concern.

Table 71 Importance of Not Seeing Other People by Location, in Percent

	Yellowstone (N=100)	Gravelly (N=99)	
Not At All Important	19.0%	7.1%	
Slightly Important	13.0%	4.0%	
Somewhat Important	20.0%	15.2%	
Moderately Important	18.0%	23.2%	
Very Important	17.0%	19.2%	
Extremely Important	13.0%	31.3%	
Chi-Square	Value	DF	Significance
	19.10	5	.0018

No significant difference between the samples was found based on the importance associated with little evidence of previous visitors (Table 72). The results suggest that this is an important attribute for both of the samples. The majority of both sample respondents reported that seeing little evidence of previous visitors was at least moderately important to their trip. This attribute appears to be slightly more important to the Gravelly users, but a surprising number of Yellowstone users also felt this to be of considerable importance. The data suggest that the Yellowstone respondents do not mind sharing their experience with other visitors, but they want the Park to appear undisturbed by previous use.

Table 72 Importance of Seeing Little Evidence of Previous Visitors by Location, in Percent

	Yellowstone (N=100)	Gravelly (N=99)	
Not At All Important	13.0%	7.1%	
Slightly Important	7.0%	12.1%	
Somewhat Important	28.0%	17.2%	
Moderately Important	21.0%	21.2%	
Very Important	17.0%	18.2%	
Extremely Important	14.0%	24.2%	
Chi-Square	Value	DF	Significance
	8.46	5	.1326

Results indicate that there is a significant difference between the samples based on the importance of seeing others involved in motorized recreation (Table 73). The majority of the Yellowstone respondents placed little importance on this attribute. The Gravelly respondents placed a greater amount of importance on seeing other motorized users, but this support was still limited. Approximately 25% of the Gravelly users rated this attribute as very important or extremely important, compared to only 9% of the Yellowstone sample.

Table 73 Importance of Seeing Others Involved in Motorized Recreation by Location, in Percent

	Yellowstone (N=100)	Gravelly (N=98)	
Not At All Important	37.0%	32.7%	
Slightly Important	20.0%	8.2%	
Somewhat Important	14.0%	14.3%	
Moderately Important	20.0%	19.4%	
Very Important	5.0%	14.3%	
Extremely Important	4.0%	11.2%	
Chi-Square	Value	DF	Significance
	13.04	5	.0230

The test results indicate that there is a statistically significant difference between the samples based on the importance of seeing others involved in non-motorized recreation (Table 74). However, these results are questionable due to a problem of small cell size. The main difference is in the proportion of respondents that reported this attribute as not at all important, 65% for the Gravelly sample and 42% for the Yellowstone sample. In practical terms, there is very little difference between the groups on this variable. The respondents in both sample attached little importance to seeing others involved in non-motorized recreation.

Table 74 Importance of seeing Others Involved in Non-Motorized Recreation by Location, in Percent

	Yellowstone (N=99)	Gravelly (N=98)	
Not At All Important	42.4%	65.3%	
Slightly Important	22.2%	11.2%	
Somewhat Important	15.2%	10.2%	
Moderately Important	9.1%	9.2%	
Very Important	5.1%	1.0%	
Extremely Important	6.1%	3.1%	
Chi-Square	Value	DF	Significance
	12.89	5	.0244

Managerial Setting Attributes

The importance of nature interpretation along the trails differed significantly between the two samples (Table 75). A substantially larger proportion, approximately 37%, of the Gravelly respondents rated interpretation as not at all important. The Yellowstone respondents were much more likely to rate nature interpretation as moderately important, with 40% to 10% respectively. Approximately 20% of the Yellowstone sample and 10% of the Gravelly sample rated this as very important or extremely important. Overall, nature interpretation appears to more important to the Yellowstone visitors.

Table 75 Importance of Nature Interpretation by Location, in Percent

	Yellowstone (N=100)	Gravelly (N=98)	
Not At All Important	8.0%	36.7%	
Slightly Important	14.0%	21.4%	
Somewhat Important	18.0%	21.4%	
Moderately Important	40.0%	10.2%	
Very Important	9.0%	7.1%	
Extremely Important	11.0%	3.1%	
Chi-Square	Value	DF	Significance
	42.25	5	.0000

A significant difference was found between the samples based on the importance attached to having the area regularly patrolled by rangers (Table 76). This management attribute was of little importance for the Gravelly respondents. Nearly three-quarters of this sample rated this variable as not at all important. There was significantly more support for these patrols among the Yellowstone sample, but the degree of importance is still limited.

Table 76 Importance of Area Patrolled by Rangers by Location, in Percent

	Yellowstone (N=100)	Gravelly (N=98)	
Not At All Important	28.0%	72.4%	
Slightly Important	15.0%	17.3%	
Somewhat Important	19.0%	5.1%	
Moderately Important	23.0%	2.0%	
Very Important	9.0%	1.0%	
Extremely Important	6.0%	2.0%	
Chi-Square	Value	DF	Significance
	52.99	5	.0000

The Yellowstone respondents placed significantly more importance on having emergency help available throughout the area (Table 77). The majority of the Gravelly respondents rated this emergency help as only slightly important or not at all important. The majority of the Yellowstone sample found this help to be at least moderately important. Overall, emergency help appears to be an important site attribute for the Yellowstone visitor, but not for the Gravelly users. The importance of emergency help may also be related to skill level; the Yellowstone respondents tend to be less skilled riders and are therefore may have a greater concern for safety.

Table 77 Importance of Emergency Help available by Location, in Percent

	Yellowstone (N=100)	Gravelly (N=98)	
Not At All Important	7.0%	36.7%	
Slightly Important	7.0%	19.4%	
Somewhat Important	22.0%	20.4%	
Moderately Important	26.0%	12.2%	
Very Important	22.0%	6.1%	
Extremely Important	16.0%	5.1%	
Chi-Square	Value	DF	Significance
	45.24	5	.0000

A significant difference between the samples was found based on the importance of trail markers (Table 78). Overall, the majority of both the Yellowstone and Gravelly respondents reported trail markers as being very important or extremely important. The main difference was that twice as many of the Yellowstone respondents as Gravelly respondents rated this attribute as extremely important, with 44% to 22% respectively. In practical terms, this difference is not of major concern, given the fact that both of the samples felt this was an important component of their snowmobile trip.

Table 78 Importance of Trail Markers by Location, in Percent

	Yellowstone (N=100)	Gravelly (N=98)	
Not At All Important	3.0%	13.3%	
Slightly Important	2.0%	4.1%	
Somewhat Important	6.0%	15.3%	
Moderately Important	14.0%	16.3%	
Very Important	31.0%	28.6%	
Extremely Important	44.0%	22.4%	
Chi-Square	Value	DF	Significance
	18.37	5	.0025

Results indicate that there is a significant difference between the two samples on the importance of having a supply of maps (Table 79). The main differences are at the two ends of the scale. The Yellowstone respondents were more likely than the Gravelly respondents to rate this attribute as extremely important, with 26% to 9% respectively. Conversely, the Gravelly respondents were more likely than the Yellowstone respondents to rate a supply of maps as not at all important, with 18% and 5% respectively.

Table 79 Importance of A Supply of Maps by Location, in Percent

	Yellowstone (N=99)	Gravelly (N=98)	
Not At All Important	5.1%	18.4%	
Slightly Important	8.1%	10.2%	
Somewhat Important	12.1%	22.4%	
Moderately Important	25.3%	17.3%	
Very Important	23.2%	22.4%	
Extremely Important	26.3%	9.2%	
Chi-Square	Value	DF	Significance
	20.31	5	.0011

There was no significant difference between the samples on the reported importance of plowed parking areas (Table 80). The majority of respondents in Yellowstone and the Gravelly's indicated that having plowed parking areas was at least moderately important to their snowmobile trip. Thus, the overall pattern of the data suggest that this management attribute is an important part of the respondents snowmobile trip.

Table 80 Importance of Plowed parking Areas by Location, in Percent

	Yellowstone (N=99)		Gravelly (N=98)
Not At All Important	10.1%		12.2%
Slightly Important	15.2%		8.2%
Somewhat Important	11.1%		15.3%
Moderately Important	24.2%		20.4%
Very Important	20.2%		27.6%
Extremely Important	19.2%		16.3%
Chi-Square	Value	DF	Significance
	4.59	5	.4685

The Yellowstone and Gravelly samples differed significantly on the importance they placed on groomed trails (Table 81). Groomed trails appear to be very important to the Yellowstone respondents. Approximately 62% of the Yellowstone users rated this attribute as very important or extremely important, compared to 17% of the Gravelly sample. The majority of the Gravelly respondents were located on the lower portion of this importance scale, however, the presence of groomed trails did have some importance to most of these users.

Table 81 Importance of Groomed Trails by Location, in Percent

	Yellowstone (N=100)		Gravelly (N=98)
Not At All Important	3.0%		27.6%
Slightly Important	5.0%		13.3%
Somewhat Important	9.0%		22.4%
Moderately Important	21.0%		19.4%
Very Important	31.0%		9.2%
Extremely Important	31.0%		8.2%
Chi-Square	Value	DF	Significance
	53.96	5	.0000

The results indicate a significant difference between the samples regarding the importance of having heated shelters in the parking area (Table 82). There was virtually no importance placed on these types of shelters among the Gravelly respondents. An overwhelming 78% of the Gravelly users reported this attribute as not at all important. There was somewhat more support for these shelters among the Yellowstone respondents, but the majority of these users felt that the shelters were not important or only slightly important. Overall, few of the survey participants regarded these type of shelters as very important to their trip.

Table 82 Importance of Heated Shelter in Parking Area by Location, in Percent

	Yellowstone (N=99)	Gravelly (N=98)	
Not At All Important	32.3%	77.6%	
Slightly Important	20.2%	9.2%	
Somewhat Important	11.1%	7.1%	
Moderately Important	19.2%	3.1%	
Very Important	7.1%	3.1%	
Extremely Important	10.1%	0.0%	
Chi-Square	Value	DF	Significance
	46.22	5	.0000

Results indicate that there is a significant difference between the samples in the importance of having outhouses along the trails (Table 83). Just over half of the Gravelly respondents reported outhouses as not at all important. Only 4% of the Gravelly sample felt that outhouses were very important or extremely important. The majority of the Yellowstone respondents reported this attribute as at least moderately important. In general, outhouses along the trail were significantly more important to the Yellowstone users.

Table 83 Importance of Outhouses Along Trails by Location, in Percent

	Yellowstone (N=98)	Gravelly (N=98)	
Not At All Important	15.3%	51.0%	
Slightly Important	7.1%	23.5%	
Somewhat Important	14.3%	16.3%	
Moderately Important	36.7%	5.1%	
Very Important	14.3%	3.1%	
Extremely Important	12.2%	1.0%	
Chi-Square	Value	DF	Significance
	67.38	5	.0000

A significant difference between the samples was found based on the importance of having small open shelters along the trails (Table 84). The Gravelly respondents placed very little importance on the availability of these shelters. The Yellowstone respondents placed a slightly higher degree of importance on these shelters. However, support for these shelters was limited among most of the Yellowstone respondents; most of these users felt that the shelters were somewhat or moderately important.

Table 84 Importance of Small Open Shelters Along Trails by Location, in Percent

	Yellowstone (N=100)	Gravelly (N=98)	
Not At All Important	11.0%	45.9%	
Slightly Important	17.0%	20.4%	
Somewhat Important	28.0%	11.2%	
Moderately Important	22.0%	12.2%	
Very Important	16.0%	6.1%	
Extremely Important	6.0%	4.1%	
Chi-Square	Value	DF	Significance
	36.17	5	.0000

There was a significant difference between the samples on the importance of with having warming huts along the trail (Table 85). Just over half of the Gravelly respondents reported warming huts as not at all important to their snowmobile trip. Overall, very little support for warming huts was found in the Gravelly sample. Approximately 47% of the Yellowstone respondents reported warming huts as at least moderately important to their trip. However, for most of the Yellowstone sample this attribute does not appear to be of great importance.

Table 85 Importance of Warming Huts Along Trails by Location, in Percent

	Yellowstone (N=99)	Gravelly (N=98)	
Not At All Important	9.1%	53.1%	
Slightly Important	17.2%	23.5%	
Somewhat Important	27.3%	12.2%	
Moderately Important	17.2%	5.1%	
Very Important	19.2%	4.1%	
Extremely Important	10.1%	2.0%	
Chi-Square	Value	DF	Significance
	58.64	5	.0000

A statistically significant difference was found between the samples based on the importance attached to the presence of public cabins in the area (Table 86). The main difference is that the Gravelly respondents (53%) were more likely to report the cabins as not at all important to their trip. However, the majority of the Yellowstone respondents also rated this attribute as not important or slightly important. Thus, in practical terms, few of the respondents felt that public cabins were very important.

Table 86 Importance of Public Cabins by Location, in Percent

	Yellowstone (N=98)	Gravelly (N=98)	
Not At All Important	39.8%	53.1%	
Slightly Important	25.5%	9.2%	
Somewhat Important	15.3%	11.2%	
Moderately Important	14.3%	10.2%	
Very Important	2.0%	7.1%	
Extremely Important	3.1%	9.2%	
Chi-Square	Value	DF	Significance
	16.45	5	.0057

Summary

Hypothesis one was accepted. The factor and cluster analysis statistically identified three benefit segments: Group Challenge, Enthusiasts, and Passive Players. These segments were found to significantly differ on the types of experiences they desired from their snowmobile trip. The study results did not fully support hypothesis two. The benefit segments did not significantly differ on the setting attributes. A statistical difference between the segments was identified for 5 of the 12 physical setting attributes, 3 of the 4 social setting attributes, and 3 of the 12 managerial setting attributes. Overall, 11 of the 28 setting attributes measured indicated a statistical difference at the .05 significance level, however, 4 of the tests were unreliable due to small cell size. Thus, the overall pattern of the data suggests that benefit segments are a poor predictor of these setting preferences.

Hypothesis three was accepted. The results indicate a significant difference (.00000) between the Yellowstone and Gravelly samples based on the distribution of respondents in each of the benefit segments. Thus, the data suggests that snowmobile users choose to visit Yellowstone National Park and the Gravelly Mountains for different reasons. Similarly,

hypothesis four was accepted; the Yellowstone and Gravelly respondents were found to significantly differ on the recreation setting attributes. A statistical difference was identified for 8 of the 12 physical setting attributes, 3 of the 4 social setting attributes, and 11 of the 12 managerial setting attributes. Overall, 22 of the 28 setting attributes indicated a statistical difference at the .05 significance level and one test was unreliable due to a problem of small cell size.

Chapter 6

CONCLUSIONS AND RECOMMENDATION

The purpose of this chapter is to discuss the primary goals and findings of this study. The central issue of this thesis concerns the hypothesized linkage between recreation activities, recreation experiences, and recreation settings. The first section of this chapter will discuss the study findings with regards to this relationship. The second section will review the limitations of the methodology employed. The third section will explore the regional implications for management, as well as the implications for recreation managers in general. This paper will conclude with a discussion on the needs for further research.

Discussion

The primary goal of this study was to explore the hypothesized linkage between recreation activities, recreation experiences, and recreation settings. Secondly, this study sought to provide further validation of the ability for the REP scales to discern differences among relatively similar (i.e. within activity) users. For this study, the recreation activity was held constant (snowmobile users) in order to specifically test the relationship between the desired experiences of these users and their preferences for setting attributes. This study attempted to establish whether users seeking different types of experiences would also seek different types of settings. To wit, are desired experiences predictive of preferred settings?

The results of this study provide strong support for concluding that snowmobile users desire different types of experiences. The factor and cluster analyses were successful in differentiating the survey respondents into three distinct benefit segments. This provides

validation of our ability to successfully identify and measure experience preferences when activity is held constant. Unfortunately, further analysis did not provide support for the hypothesis that setting preferences differ between benefit segments. This is an important finding, because the hypothesize link between desired experiences and preferred settings is a fundamental assumption underlying the ROS management framework.

Paradoxically, the results of hypotheses three and four do provide some credence to the theoretical relationship between experiences and settings. The data analysis was successful in establishing that snowmobile users in Yellowstone National Park and the Gravelly Mountains desire different experiences from their recreational engagements. Furthermore, the results also support the conclusion that snowmobile users in Yellowstone and the Gravelly's desire different settings. These findings provide indirect support for the contention that users seeking certain types of experiences will choose recreation settings that are likely to meet their expectations.

Limitations

This study had several limitations relating to the methodology and sampling techniques that were used. Due to time constraints the researcher was unable to go through the Office of Management and Budget procedures in order to gain permission to sample users within Yellowstone National Park. Thus, snowmobile users in West Yellowstone were sampled in several snowmobile rental stores, hotels, and restaurants which cater to winter visitors. This sampling procedure limits, to some degree, the ability to make inferences about Yellowstone winter visitors at large. The main drawback is that some types of users may be underrepresented in this sample. Users that stay in recreation vehicles, in cabins, or with

friends may be less likely to be included with this sampling technique. These users may also be less likely to eat at local restaurants or rent snowmobiles.

A second limitation of the sampling procedure deals with survey locations in the Gravelly Mountains. Data collection was done at the West Fork rest area on the Gravelly Range. This rest area serves as a loading and unloading point for snowmobiles and for parking of vehicles. This location targets the bulk of the snowmobile users in the western portion of the Gravelly Mountains. However, many of the snowmobile users from Yellowstone National Park often travel into the Gravelly's while riding their machines via other routes. Due to environmental conditions it was not possible to adequately sample these users. The main drawback is that a clear representation of the visitors coming from Yellowstone was not obtained.

The final limitation of this study deals with the sample size. Monetary constraints limited the responsibility for the data collection to just the researcher. In addition, stopping all snowmobile users was often difficult, particularly while sampling at snowmobile rental stores. In general, the snowmobile users tended to spend most of the day riding in the Park or on Forest Service lands and the bulk of these users typically returned at a similar time at the end of the day. This is particularly true for those renting snowmobiles. Thus, a large proportion of potential survey participants arrived at the sampling locations at relatively the same time at the end of each day. It was difficult for the researcher to sample all of these visitors due to the large volume of snowmobile users at one time. As a result of a combination of these factors, the sample size for this study was less than expected. The main drawback is that a larger number of benefit segments may have been identified with a larger sample.

Regional Implications

Many respondents came to Yellowstone primarily to see the Park in the winter. The majority of these visitors then complimented their trip into the Park by riding their snowmobiles into the nearby National Forests. Thus, Yellowstone National Park serves to draw many people to this region. Once here, these visitors begin to explore the areas around the Park. This exploration has primarily been focused on the Gallatin and Targhee National Forests, but it is likely to continue to expand outward into areas such as the Gravelly Mountains. Indeed, there is evidence to suggest that this expansion has already reached the Gravelly's. Currently, there does not appear to be a great deal of crossover from the Park to this area, but visitation rates are likely to increase.

The reasons people snowmobile in the Gravelly's is typically different than why they chose to visit the Park. At the aggregate level, most of the snowmobile users in both types of environments have the desire to experience the beautiful scenery, mountains, and good snow conditions found throughout the Yellowstone Region. In this sense, the motivations for visiting these areas are very similar; the Rocky Mountains offer quality snowmobile riding opportunities. However, this is where much of the similarity ends. The demand for a certain types of site attributes and the degree of services available is very different among snowmobile users in areas such as Yellowstone and the Gravelly's.

Yellowstone National Park offers snowmobile users the beauty of the Rocky Mountains in the winter, along with the convenience of motels, restaurants, and other modern services. Wildlife is abundant, trails are groomed, and snowmobile experience is not necessary. In contrast, areas like the Gravelly Mountains provide a more remote and rugged experience. Visitors to these areas must generally be more skilled and few modern

conveniences are available. Between these two extremes are the National Forests lands immediately adjacent to the Park. These areas provide many snowmobile trails close to the town of West Yellowstone and the Park. These areas give snowmobile users more freedom of where to ride and more challenging terrain, yet they are not far from modern services.

The data suggests that the Yellowstone Region contains a diverse range of snowmobile opportunities. Yellowstone National Park probably does not need to provide a wider range of snowmobile opportunities than currently exists within the Park boundaries. The survey respondents within the Park appear to be satisfied with the experiences they received from their visit. Although, there was some reported dissatisfaction with the trail conditions. Yellowstone managers need to be concerned with the future conditions of the Park and surrounding forests. The data suggests that there is also some dissatisfaction associated with the volume of visitors. If use levels continue to increase, the experiences currently provided by the Park may be altered.

Winter use levels within this region are of concern to a range of public land managers. Yellowstone managers are particularly concerned with the growth of snowmobile use within the Park in recent years. If snowmobile use continues to increase, Yellowstone may limit the amount of use within the Park. This would likely effect other public lands in the region. The National Forests cannot ignore what is happening in the Park. As snowmobile use increases in Yellowstone National Park or even if limitations on use levels are instituted, the National Forests will most likely continue to see increased growth in snowmobile use. In order to provide visitors with quality experiences, Yellowstone National Park and the nearby National Forests must work together to provide a desirable range of satisfying experiences for the Yellowstone Region.

The data suggests that the Gravelly users do not currently desire many amenities or evidence of management. The majority of the current users prefer limiting management to basic support roles, such as groomed parking areas, some groomed trails, trail signs, and maps. These users enjoy the primitive nature of the area and the limited use levels. However, local managers must also be concerned with the future conditions of the area. Currently, local users dominate the area and they receive their information about the area from friends and family as well as their past experiences in the region. In the future, if land managers experience a continued increase in the popularity of the Yellowstone Region for snowmobiling it may mean more visitors to the Gravelly's which may result in conflict between new and old users and feelings of crowding.

As the visitors from Yellowstone continue to expand into the Gravelly Mountains, not only will the number of users increase, but this influx will bring different types of users. Since the Yellowstone snowmobile population is less experienced, they will likely travel into the Gravelly Mountains with the aid of professional guides. These new users are also likely to demand more services and active management of the area. Over time, the recreation setting will change and the new users may begin to displace the current users. This raises important questions, such as, where will these displaced users go? Managers must be aware of these dynamics, especially in relation to the range of opportunities available throughout the region. The results of this study suggest that the Gravelly managers need to be concerned with preserving the current recreation experiences.

Implications for Recreation Management

The findings presented in this paper have important implications for recreation managers in general. The managers in the Yellowstone Region and elsewhere face similar problems. If management frameworks, such as the Recreation Opportunity Spectrum are going to work, managers need to be able to identify and measure the experiences that visitors seek. Furthermore, they must also be able to relate this information to preferences for settings. The ability to predict, and therefore provide desirable recreation settings is a fundamental component of these management strategies.

Unfortunately, the methods employed in this study failed to successfully identify a direct causal link between the snowmobile users desired experiences and their reported setting preferences. The inability of researchers to empirically identify these linkages are troublesome for all recreation managers. For managers to successfully provide a diverse range of recreation experiences, they must be able to provide the appropriate diversity of recreation settings. Therefore, if these relationships continue to thwart measurement then all attempts to provide the full range of experiences demanded by the public will be limited.

On the positive side, an indirect relationship between experiences and settings was found. These results may simply reflect the fact that the snowmobile users in this region are a rather homogeneous group, but this explanation does not fully explain the differences found between snowmobile users in different locations. The Yellowstone and Gravelly respondents desire different experiences and thus have chosen areas that provide the type of setting they prefer. Alternatively, stronger support for the relationship between experience and setting may have been found if different setting attributes were used. This suggests that it may indeed be

possible for researchers to eventually succeed in their efforts to empirically measure these relationships.

Future Research

With the significant growth in snowmobile use in Yellowstone National Park in recent years, the Park managers must be concerned with the potential impacts this increasing use may have on the recreation experience. This research does not indicate that any major problem exists at the current use levels, but some of the data was indicative of potential dissatisfaction with increased use. Future research should explore feelings of crowding among the visitors as well as preferred use levels. One aspect that may interest the Yellowstone managers involves the fact that over one-third of the Yellowstone respondents (Passive Players) were primarily concerned with seeing the Park in the winter. These respondents were less concerned with their mode of travel (snowmobile). This data suggests that the Passive Players may be amenable to visiting the Park via snowcoaches rather than snowmobiles. This could result in a significant decrease of snowmobiles in the Park without restricting current use levels. More research is needed to accurately assess the visitors' feelings toward alternative transportation sources, such as snowcoaches.

The National Forest lands close to the Park may also have a difficult time coping with increasing use levels. These areas already receive a significant amount of use and this use will likely grow regardless of use levels in the Park. These areas are also sensitive to policy changes within Yellowstone National Park. In order to maintain quality recreation throughout the region, a diversity in winter recreation opportunities must be provided. More research is needed in order to accurately assess the desired future conditions of these areas.

The needs for this research and the methods employed to obtain the necessary information are directly related to the primary finding of this study. The concerns raised by Schreyer et al. (1984) may indeed provide insight for understanding the link between desired experiences and preferred settings. A partial explanation of the results obtained in this study may be found in the generality of the motive scales and the motive intensity of the snowmobile users. The REP scales have been criticized for their lack of specificity and their inability to measure motive intensity.

The REP scales have proved successful to a degree. These scales have proved reliable in segmenting users in numerous studies, including this one. However, establishing the linkage to settings as proved elusive. Interestingly, the relationship between the benefit segment and the recreation setting was not entirely absent in this study. The Enthusiasts and the Passive Players were found to be very different in both the experiences they sought and the types of settings they preferred. The proportional distribution of these users was also quite dramatic. Approximately 75% of the Enthusiasts were located in the Gravelly's and 85% of the Passive Players were found in Yellowstone. This suggests that the link between experiences and setting does indeed exist and that it may be possible to measure.

The Group Challenge segment has proved the most interesting in regards to the measurement of experiences and setting attributes. This segment was found in both Yellowstone and the Gravelly's in equal proportions. Based on their REP scores these respondents rated similarly on various measures. The data suggests that the Group Challenge respondents are seeking the same types of experiences from two very different recreation settings. The generality of the motive scales may be an intervening variable. For example, the Group Challenge users scored high on the challenge, fun, and adventure measures. However,

the definition of what constitutes a challenge or an adventure is likely to be very different between users.

It appears that the REP scales may not define the desired experiences of users in Yellowstone and the Gravelly's with enough specificity. Schreyer et al. (1984) have suggested a more qualitative approach to measuring and understanding visitor motivations. They also suggest that the recreation setting should be measured on a more holistic level, rather than at the attribute level, however, it is unclear as to how useful such a definition would be to managers. The best alternative at this point, may require a combined approach, utilizing qualitative and quantitative methods. Future research is needed to measure desired experiences with a greater degree of specificity. More research is also needed concerning the most appropriate scale for measuring the recreation setting. Future research may also explore the importance of place attachment to the recreation experience of visitors to these areas. Place attachment may be particularly relevant to the Gravelly Mountains which receives a high concentration of use from local residents.

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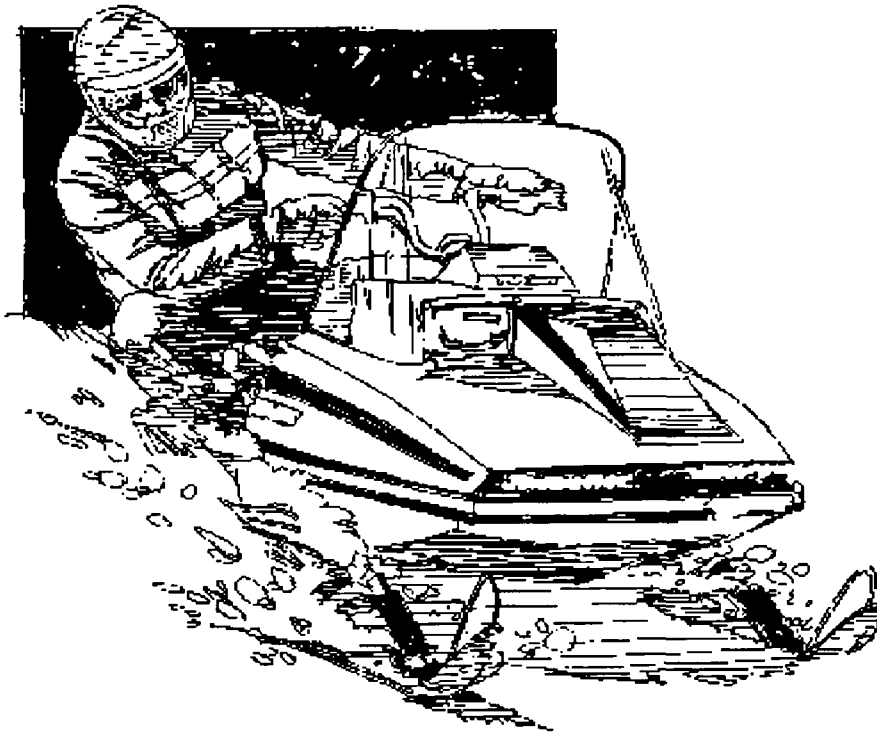
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APPENDIX A

Yellowstone Region 1997 Snowmobile User Survey

Yellowstone Region

1997 Snowmobile User Survey



**Recreation Management Program,
The Bolle Center,
and
Institute for Tourism and Recreation Research
School of Forestry
University of Montana
Missoula, Montana**

Winter 1997

Dear Beaverhead National Forest Visitor:

This survey is being conducted by the Recreation Management Program, the Bolle Center for People and Forests, and the Institute for Tourism and Recreation Research in the School of Forestry at The University of Montana. We would appreciate a few minutes of your time to answer this survey. We are interested in the reasons why you chose to visit this area and your snowmobiling experience. Your responses to these questions will help managers of Beaverhead National Forest to provide quality recreational experiences within the Gravelly mountain range. In addition, this survey will be used as a graduate research project at The University of Montana.

We ask that **only you** personally respond to all questions so that your answers represent just your views. Response to this request is voluntary. Your name is requested for follow-up mailing purposes only. When analysis of the questionnaire is completed, all names and address files will be destroyed. Thus the permanent data will be anonymous. Please complete the following questionnaire and return it in the self-addressed, postage paid envelope provided.

Thank you for your cooperation. If you have any questions or concerns, please contact us at (406) 243-6650. We appreciate your effort to respond to these questions.

Sincerely,

Steve McCool
Professor
University of Montana

Eric Schultz
Graduate Student
University of Montana

Visit to Yellowstone National Park

1. During this visit, how would you describe your group?
 - Alone
 - Couple
 - Family
 - Friends
 - Friends and family
 - With outfitter
 - Other, please describe: _____

2. How many times have you snowmobiled in Yellowstone National Park prior to this visit?
 - This was my first visit.
 - OR**, number of times, **not including this visit:** _____
 - OR**, too many times to remember

3. Did you snowmobile in nearby National Forest lands during this trip?
 - Yes- If Yes, How many days? _____
 - No - If No, go to Question 5.

4. In which National Forest(s) did you engage in snowmobiling activities?

5. Are you a Montana Resident? Yes No

If yes, how many years have you lived in Montana? _____

6. Did you most often ride single or double on your snowmobile during this trip?
(Please check one)
 - Single
 - Double

7. Which one of the following types of accommodations did you use most on this trip?
 - Motel RV camping Cabin
 - Tent camper Stayed at home Other _____

8. What is the total number of nights you stayed within 50 miles of Yellowstone during your trip? _____
9. How many hours did you spend snowmobiling **inside** the Park during your visit?
_____ Hours
10. How many hours did you spend snowmobiling **outside** the Park during your visit?
_____ Hours
11. How many years have you operated a snowmobile?
_____ Years
12. How many days per year do you usually operate a snowmobile?
_____ Days
13. Do you currently own a snowmobile? Yes No
14. Did you rent a snowmobile on this trip? Yes No
15. How would you rate your skill level as a snowmobiler?
(Circle only one)
- Beginner Intermediate Expert
16. How important is Yellowstone National Park to your participation in snowmobiling? (Circle only one)
- Not at all Important Very Important
 1 2 3 4 5
17. What was the most important reason why you chose to visit Yellowstone?

18. Where did you get your information about this area from?

	Not at all Important	Slightly Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
I snowmobile in Yellowstone:						
for adventure.	()	()	()	()	()	()
to have fun.	()	()	()	()	()	()
because I thought it would be a challenge.	()	()	()	()	()	()

Preferred Site Attributes

20. The following items relate to the type of area that you prefer to snowmobile in. Please read each item carefully and rate its importance to you when you go snowmobiling. (*Check only one for each item*)

	Not at all Important	Slightly Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
When I go snowmobiling, I prefer:						
seeing some wildlife.	()	()	()	()	()	()
scenic overlooks.	()	()	()	()	()	()
long trails.	()	()	()	()	()	()
nature interpretation along trails.	()	()	()	()	()	()
the area to be regularly patrolled by rangers.	()	()	()	()	()	()
untracked open meadows.	()	()	()	()	()	()
emergency help throughout the area.	()	()	()	()	()	()
small open shelters along the trail.	()	()	()	()	()	()
not seeing other people.	()	()	()	()	()	()
seeing others involved in motorized recreation.	()	()	()	()	()	()
groomed trails.	()	()	()	()	()	()
trail markers.	()	()	()	()	()	()
clearcuts in forested areas.	()	()	()	()	()	()
to view water.	()	()	()	()	()	()
little evidence of previous visitors.	()	()	()	()	()	()

When I go snowmobiling, I prefer:	Not at all Important	Slightly Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
heated shelters at the parking area.	()	()	()	()	()	()
plowed parking areas.	()	()	()	()	()	()
seeing a lot of wildlife.	()	()	()	()	()	()
warming huts along trail.	()	()	()	()	()	()
seeing others involved in non- motorized recreation.	()	()	()	()	()	()
seeing unique geological features.	()	()	()	()	()	()
a supply of maps.	()	()	()	()	()	()
looped trails.	()	()	()	()	()	()
dry, cold snow conditions	()	()	()	()	()	()
forested areas thinned by logging.	()	()	()	()	()	()
outhouses along the trail.	()	()	()	()	()	()
views of mountains.	()	()	()	()	()	()
the presence of public cabins.	()	()	()	()	()	()

Management Actions

21. The following items are related to hypothetical management actions. These items in no way reflect the current intentions of the management agencies. Please indicate the extent to which you agree or disagree with the following items. *(Check only one for each item)*

In Yellowstone I would support:	Strongly Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Strongly Agree
limiting the number of people that use the area.	()	()	()	()	()
requiring a permit to use the area.	()	()	()	()	()
limiting the number of days per week that snowmobiling is allowed in the area.	()	()	()	()	()
discouraging use of the area by large groups.	()	()	()	()	()
encouraging large groups to use the area.	()	()	()	()	()
increasing fees for use of the area.	()	()	()	()	()

Survey No.: _____

Satisfaction

22. What was the most satisfying aspect of this snowmobiling trip to Yellowstone? _____
23. What was the most dissatisfying aspect of this snowmobiling trip to Yellowstone? _____

Information About You

24. What is your age? _____ Years
25. Are you? Male Female
26. What is your ethnic origin? (*Check one*)
- White Hispanic American Indian
- Black Asian Other
27. What is the last year of school you have completed? (*Circle one*)
- | | | | |
|---------------------------------|---------------------------|------------------------|------------------------|
| Grade School
1 2 3 4 5 6 7 8 | High School
9 10 11 12 | College
13 14 15 16 | Graduate School
17+ |
|---------------------------------|---------------------------|------------------------|------------------------|
28. How many adults live in your household, including yourself?
- _____ Adults
29. How many children live in your household? (*Under 18 yrs.*)
- _____ Children
30. What is the zip code of your residence? _____
31. What is your current occupation? _____

Thank you for your cooperation.

Please place this survey in the postage-paid envelope provided and drop it in the nearest mailbox.

APPENDIX B

Replacement Questionnaire Cover Letter



The Bolle Center for People & Forests
Science Complex 465
The University of Montana
Missoula, Montana 59812
Phone: (406) 243-6650
FAX: (406) 243-6656

Dear Beaverhead National Forest Visitor

Several weeks ago we sought your cooperation in a study of visitors to the Gravelly Mountains in the Beaverhead National Forest. As of this day, we have not received your completed questionnaire.

This study involves questions about your snowmobiling experience, your preferences for site attributes, and other information essential to proper management of the area. Because only a limited number of individuals have been included in the study, your cooperation is important.

Enclosed is another copy of the questionnaire in the event that you have misplaced the original. Please take a few minutes to complete the questionnaire within the next several days. Place it in the postage-paid, self addressed envelope and drop it in any convenient mailbox. Your help is greatly appreciated.

If you have already sent your questionnaire to us, we want to thank you for your cooperation.

Sincerely,

Eric Schultz
Graduate Student

enclosures



APPENDIX C

Snowmobile User Sampling Plan

SAMPLING SYSTEM

The sampling objective for this study was to obtain a representative sample of adult snowmobile users in West Yellowstone and the Gravelly Mountains. Due to logistic and financial constraints, sampling was originally planned for one full week and one weekend in both West Yellowstone and the Gravelly's. However, because of weather conditions and low use levels, sampling in the Gravelly's was done primarily over multiple weekends. Sampling in West Yellowstone was conducted from February 17 to February 23, 1997 and again from March 7 to March 9, 1997. Sampling in the Gravelly's began on February 24, 1997 and resumed on February 28 to March 2, 1997. Subsequent sampling periods for the Gravelly's ran from March 14 to March 16, 1997, March 21 to March 23, 1997, April 4 to April 6, 1997, and April 12 to April 13, 1997.

During pre-sample planning, it was decided to sample users during a five hour period each day from 1:00pm to 6:00pm. However, due to use patterns most of the sampling was done between 4:00pm and 7:00pm each day. The sampling location within West Yellowstone was chosen randomly each day using a random number table. The sampling location for the Gravelly's was generally fixed, relying on the West Fork rest area. However, several attempts were made to sample in other locations within this area, but weather conditions interfered. Many users to this area often ride in at Reynolds Pass, but the parking area for this entrance was snowed in during the sample period, thus use to this location was low. An attempt was also made to sample users at Elk Lake Resort, but severe weather hampered use levels. Further sampling within the mountain range was limited by the availability of snowmobiles and personnel.