Winter Experiences of Old Faithful Visitors in Yellowstone National Park

Submitted to:

Final Report

John Sacklin, Management Assistant, Yellowstone National Park

By:

Wayne Freimund

Mike Patterson

Keith Bosak

Shelley Walker Saxen

The University of Montana, Department of Society and Conservation

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Executive Summary

This study was designed as three sub-studies to address the following four general objectives.

- To better understand the actual dynamics of the visitor experience of natural sounds.
- To better understand visitor perceptions of the practical need for mechanical sound presence during a park visit.
- To better understand visitor appraisals of human-bison interactions associated with mechanized winter use in YNP.
- To gain insight into guides' perceptions of the effectiveness of new winter visitor management policies in Yellowstone National Park.

Soundscape Sub-study

Surveys were conducted on twenty days spread across the winter season, eleven of which were weekdays and nine of which were weekend days. The potential respondent universe for the soundscape survey was all visitors, eighteen years of age or older, stopping at Snow Lodge and Old Faithful from 1/02/08 to 3/09/08. Four of hundred-thirteen of four hundred twenty-seven visitors approached agreed to participate. Forty-five interviews ranging in length from fifteen to twenty-five minutes each were also conducted during this time.

The soundscape sub-study results:

- Winter visitors to Old Faithful agree that Yellowstone is a place for natural quiet, to hear natural sounds and a quiet place.
- There is less agreement among winter visitors that Yellowstone is a place free of motorized noise.
- The opportunity to experience natural sounds is perceived by winter visitors to be important to both the value of Yellowstone and visitors' experiences.
- While there are some variations in the importance when activity type is considered, those differences are within the degree of support for Yellowstone as a place for natural quiet, to hear natural sounds.
- Visitors who participated in snowmobiling or snow coach touring were somewhat less likely than other winter visitors to agree that Yellowstone is a "place free of motorized noise."

- Eighty-one percent of the respondents indicated that the park's natural sounds had a positive effect on their experience.

- Satisfaction with the natural sounds within their experience remained high and seventy-one percent of the visitors suggested they found the level of natural sound they desired for half or more of the time they desired it. Eighty-seven percent of the respondents were "very satisfied" with their overall park experience and the remaining thirteen percent were "satisfied."

- Respondents were asked about their support for a variety of management actions "to protect opportunities to experience natural sounds." Requiring best available technology (defined as clean, quiet snowmobiles), continuing to require guides, limiting the total number of snow machines in the park per day and limiting group sizes to 11 per guide were strongly supported by a minimum of sixty-eight percent of the respondents. Closing the roads to all over snow vehicles or to snowmobiles only was opposed or strongly opposed by a majority of the respondents. Plowing the roads for automobile access was strongly opposed by seventy-one percent of the respondents and opposed by another nine percent.

- In-depth interviews illustrate that the natural soundscape assists in providing a deep connection to nature that is restorative and even spiritual for some visitors. Natural sounds influenced respondents' motivation to visit Yellowstone and were an unexpected yet significant part of the experience for over a third of the interviewees. All interviewees indicated that the natural sounds they heard are part of what makes the park special.

- While interviewees predominantly accept mechanical sounds in the park, especially near developed areas they generally wanted some time in their experience to be quiet and natural.

Bison Interaction Sub-study

- The opportunity to view bison was very important to winter visitors (71% very important) and 87 percent of the visitors were very satisfied with their encounters with bison.

- When asked to describe their bison interactions:

    - Ninety-nine percent of the visitors had seen bison by the time they reached Old Faithful. On average, visitors had seen bison 8 times when they arrived at Old Faithful

    - Of these interactions, 99 percent of the visitors had at least one encounter when the bison appeared not to react to the oversnow vehicles and only 21% indicated witnessing an encounter when the bison appeared hurried, took flight, or was defensive (the three most intense reactions examined in the survey).

- When asked to assess the intense bison reaction witnessed, those seeing the most intense responses from bison (hurried, took flight, or were defensive):

- Are more likely than statistically expected to describe the bison in the specific incident as agitated (37% vs. 2% for the "no response" visitors) and are more likely to describe the bison in the park overall as stressed (32% vs. 11%) and dangerous (56% vs. 33%).

- There is a relationship between intensity of bison response to humans and normative judgments about acceptability/appropriateness of those specific interactions (as a group those who witness the most intense bison response are less likely to find them very acceptable/appropriate and more likely characterize them as somewhat inappropriate).

- Nonetheless, the majority of visitors who witnessed the most intense bison responses described the situations as acceptable/appropriate (72-78%).

- Influence of primary activity:

  - Primary activity type was not a major influence on winter visitors' appraisals of specific bison interactions.

  - However, activity type had a slight influence over winter visitors' perceptions of bison – most notably skiers are more likely than snowmobilers to see bison as dangerous (60% vs. 23.2%) and more likely to describe bison as stressed rather than peaceful (28% vs. 6%).

Guide Sub-study

The data collection component of the guide sub-study was carried out in January of 2008 in the Old Faithful area. This area acts as a collection point for both snowmobile and snow coach tours as most come for lunch and to watch the geysers. Guides were approached in various places such as the parking lot, Visitor's Center, lodge and gas station. Twenty-two guides were approached for interviews and all agreed to be participants. Of the twenty-two respondents, nine were working as snowmobile guides, ten were snowcoach guides' and three were working as both. Six of the guides interviewed were female and sixteen were male.

Guide sub-study results:

- Unanimity in opinion that Best Available Technology (BAT) requirements and guiding have improved conditions in the park
- There were mixed results on opinions regarding BAT effects on wildlife
- The guides focus heavily on education and interpretation and try to transfer the values of the park as a place to experience natural beauty to their clients
- Guides viewed their responsibility of enforcing park regulations as a high priority
- There was some perception that visitor characteristics are changing. Particularly snowmobilers who are now coming to experience the park on a snowmobile rather than using the park to experience a snowmobile
- Some guides were opposed to the guiding requirement because they felt it inhibited people's freedom to experience the park on their own terms. Also, a few commented that the requirement has kept local snowmobilers and others out because of high costs.

- Many snowmobile guides commented that they observed changes in their clients' attitudes towards the guiding requirement through the course of a visit from negative to positive, particularly due to the education and interpretation provided.
- Snowmobile guides wanted smaller group sizes because they perceive smaller group sizes to enhance visitors' experiences and safety.
- Suggestions for improvement were minimal and most thought that NPS was doing a good job with the current regulations
- Philosophically, a few guides commented that having winter visitors helps create advocates for the park.

1 ACKNOWLEDGEMENTS

This report is the product of considerable patience and effort. The staff of Yellowstone National Park was helpful in conceptualizing the problem, organizing considerable logistics and assisting us in negotiating both the NPS and OMB review process. When we learned that the study would need to go through a complete Federal Register review (effectively postponing the study for a year), they showed considerable patience and encouragement. John Sacklin, Mike Yochim and Denice Swanke are a pleasure to work with.

At the University of Montana we were assisted in conceptualizing the study by a team of graduate students led by Shelley Saxen, Melissa Baker and Ernita Van Wyk. Their reviews of the literature and constructive debate about frameworks for analysis and research methods were very influential to this project. Shelley stuck with the project in spite of the delays to do her dissertation on the natural soundscape of Yellowstone. Guidance was also provided by Shan Burson, Skip Ambrose, and the NPS Natural Sounds Program, led by Karen Trevino. Wylie Carr and Molly Ryan did an outstanding job of data collection and entry we greatly appreciate their flexibility. Ali Dimond provided a thoughtful edit. Finally, we are grateful to the more than 800 winter visitors who gave of their time and shared their experiences and thoughts about Yellowstone.

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2 BACKGROUND

Yellowstone National Park is arguably the most well known national park in the world. Visitation to Yellowstone has exceeded three million annual visitors most of the past 12 years. On a busy summer day, the 30,000 plus people traveling within the park mostly stay close to roads and attractions. While the geography of the park includes over two million acres of land (90% of which is recommended as wilderness), visitor management within the park is highly similar to what would be involved in an urban proximate park.

The management of winter use has been of growing concern to the National Park Service since the mid-1980s as the popularity of snowmobiles has grown in American culture (Yochim, 2003). Winter use planning in Yellowstone National Park explicitly started in the 1990s, as a broader range of interest groups began pressuring park management through lawsuits to prioritize specific resource values such as wildlife habitat, economic development and public access (Sacklin et al. 2000).

Winter use plans have prescribed two general forms of snowmobile management in the past decade: 1) completely eliminating snowmobile access to the park; or 2) providing a limited amount of access under a guided management regime. Competition among the basic goals of national park management -- protecting park resources in an unimpaired fashion while providing for visitor access and enjoyment -- have been central to this planning environment. The plan in place at the time of this research limited snowmobile numbers in the park to 720 per day. Snowmobiles were also required to use the best available technology, which meant the use of quieter and less polluting four stroke engines (referred to in this report as Best Available

Technology). The quieter engines are in part required to have a positive effect on the visitor experience.

Human – bison interactions occur because viewing bison is a primary motivation for many winter visitors but their viewing behavior may also impact bison behavior. The potential for these impacts raises questions about whether the values visitors and the public at large hold with regard to Yellowstone National Park's (YNP) bison are impaired. Similarly, the agency strives to preserve natural soundscapes in part because of the effect that sounds can have on wildlife and because people value natural sounds in the type of wilderness settings that many associate with national parks. Thus, knowing how visitors perceive human – bison interactions and park soundscapes are important inputs in helping park managers understand how winter use affects park resources and values.

Requiring all visits to be guided is intended to minimize visitor impacts on the natural environment. The presence of guides can potentially better insure that visitors behave in a way that mitigates impacts of their presence near bison. The policy requiring guides, however, stands to change the visitor experience considerably. The requirement of a guide adds expense, constrains movement by requiring all visitors to travel at the pace of a group, often forces an experience shared with strangers, and, as intended, can constrain, behavior. These features of the experience may be seen as impositions to some visitors.

While each of these resources (bison and the natural soundscape) has been monitored in the park, an understanding of how they are perceived and experienced by visitors remains incomplete. This study was designed to provide managers with a better understanding of the roles of natural soundscapes and bison interactions in the experiences of winter visitors. First,

the study will provide park managers with specific information on visitor perceptions of the experience of natural sounds in YNP in winter. Second it will provide managers with a better understanding of visitor perceptions of human interactions with bison during the winter. Both of these issues will be addressed with a particular focus on the Old Faithful area, which is a primary are of winter visitor use and an important location for bison's winter range. This information will assist managers in understanding the affects of current and proposed management actions on visitor experiences. Guiding, being a new policy, is assessed from the perspective of guides and visitors and in the context of the new winter use policies.

2.1.1 Study Objectives

This study was designed as three sub-studies to address the following four general objectives.

- To better understand the actual dynamics of the visitor experience of natural sounds.
- To better understand visitor perceptions of the practical need for mechanical sound presence during a park visit.
- To better understand visitor appraisals of human-bison interactions with an emphasis on those associated with mechanized winter use in YNP.
- To gain insight into guides' perceptions of the effectiveness of new winter visitor management policies in Yellowstone National Park.

The remainder of this report is organized in three sections, each reporting results of a sub-study within the project. Section three (3) of the report relates the findings of the Soundscape sub-study, which employed both a visitor survey and a series of in-depth interviews and addresses. Section four (4) of the report presents the findings of the Human-Bison sub-study.

Section five (5) of the report provides the results of interviews with Snowmobile and Snowcoach tour guides.

3 THE PERCEPTION AND IMPORTANCE OF NATURAL SOUND AND THE YELLOWSTONE WINTER SETTING

Natural soundscapes are becoming increasingly valued and appreciated as important resources. Hearing natural sounds and experiencing quiet act as motivations for recreational use and are valued by visitors (Driver et al., 1991; Kariel, 1980, Gramann, 1999). Little is known, however, about the process and dimensions of the actual experience of natural sounds in parks generally and in YNP specifically. How visitors describe sound, when they notice it, how it relates to other aspects of their experience has not been documented. The purpose of this portion of the study is to describe dynamics of winter visitors' experiences of the soundscape environment in Yellowstone National Park. Additionally, visitor's perceptions about how management should protect natural soundscapes are explored.

3.1 Previous Research

Limited social science has been conducted concerning the experience of natural sounds in park settings until now. Existing studies do indicate that the vast majority of visitors to national parks feel that an important part of their visit is to enjoy natural quiet and the sounds of nature (Mace and others 2004; National Park Service 2006). In wildland settings, people tend to be very sensitive to even low levels of sound from human sources. This holds true for both studies conducted in the field and in laboratory settings (Mace and others 2004). Noise in parks can also be annoying or intrusive to visitors (Miller 1999) and can detract from their enjoyment of the

experience. Further inquiry into the role of the natural soundscape in visitors' experiences provides a critical link between the soundscape policy framework and precise managerial implications. The knowledge from this extant research concerning general trends in visitors broad-scale perceptions of natural sounds and "noise" informed the design of both survey and interview questions related to visitors' experiences of natural sounds in Yellowstone National Park.

Previous social science research on natural soundscapes is composed primarily of dose-response studies that demonstrate negative effects of mechanized sounds on the visitor experience (Fidell and others 1996). Mace and others (1999) employed a laboratory design by asking respondents to compare slides of Grand Canyon landscapes coupled with natural sounds and those of aircraft and helicopter over flights. They found consistent negative effects of aircraft sounds on participant assessments of naturalness, preference, beauty, annoyance, tranquility, and solitude.

Other studies have assessed the relationship between the soundscape and recreational conflicts. Vitterso and others (2004) conducted an experimental study where two groups of skiers responded to a questionnaire about their emotional state and mood. One group was exposed to snowmobile sounds during their ski, while the other group was not. Results showed that the emotional state of skiers who encountered the snowmobile noise was impacted negatively.

Additional research has demonstrated the restorative effects of experiences in nature on park visitors (Anderson and others 1983; Hartig and others 1991; Kariel 1990; Ulrich and others 1991). One experimental study by Hartig and others (1991) asked participants to engage in

activities which cause mental fatigue and then assigned them to treatment groups: reading magazines indoors and listening to music, walking in a clean urban area, and walking in a regional park next to a stream. Individuals who walked in the park exhibited greater improvements in their psychological states than did the other groups. Freimund and others (2002) investigated visitor tolerance for frequency of hearing motorized transportation at the Gwaii Hannas Park Reserve. They employed video surveys to assess visitor norms for sounds from aircraft over flights and motorized boats in different settings. Their results show that front country visitors exhibited a higher tolerance than backcountry visitors for such mechanized sounds and that in each setting, visitors' differenced among the acceptability of differing sounds (e.g, boat, aircraft). A recent study by Grau (2005) used a multi-sensory approach incorporating different sounds into a visual crowding model. Survey respondents evaluated slides of Zion National Park representing different levels of visitor density. These images were shown with and without different levels and types of sounds. Participants were exposed to natural as well as man-made sounds such as talking and laughing. The results suggest that sounds are just as, if not more important than other setting attributes as visitors' evaluated the acceptability of the Virgin River setting.

Newman and others (2005) recently studied the emotions and thoughts visitors associate with hearing particular sounds at Muir Woods National Monument. Participants in different locations within the Muir Woods National Monument were asked to close their eyes and listen to all of the sounds they could hear in that area. Following the listening exercise, participants completed a survey identifying what sounds they heard and rated them on scales ranging from "very pleasant" to "very annoying". Visitors consistently appreciated natural sounds more than human-caused sounds.

Work completed by Staples (1998) has criticized the trend in soundscape research focusing on dose-response studies and levels of visitor annoyance. He argues that such studies have been unable to adequately explain the differences in individual assessments of the soundscape. He further claims that what is needed is greater managerial understanding of how individuals conceptualize, attribute meaning, and understand the soundscape and impacts to it (Pilcher 2006; Staples 1998). This perspective highlights the research and managerial problem related to the fact that visitor appraisals of the soundscape may not correspond well with measurable soundscape impacts; while there may be demonstrable deterioration in the acoustic environment, that does not necessarily mean that parallel visitor evaluation and understanding of their experiences of the soundscape will also be negative (Pilcher 2006).

In this study we used a mixed-method approach to yield different types of information that is all foundationally informative to soundscape managers and researchers. The research had two distinct, yet related components. The survey portion of the study provides a means of generally characterizing the visitor population and discussing overall perceptions of natural soundscape experiences in the park. The survey portion also acknowledges the role that values play as drivers of human preferences and behavior. It utilized a park values scale (Borrie et al 2002, Tanner et. al 2008) to explore relationships between national park values and visitor perceptions of the importance of natural sounds. The survey instrument provided a means of generally characterizing the role and importance of natural sounds to the park population. The interview portion provides an in-depth account of the range of experiences of natural sounds and their significance to visitor experiences. The interviews provided the necessary opportunity for exploration of individual and group perceptions of both the experience of the natural soundscape and the types of biophysical setting attributes important in winter visitor experiences of

Yellowstone National Park. For details on the theoretical and methodological foundations of these instruments please see Saxen (2008).

3.2 Survey Methods: Selection of Survey Respondents and Survey Analysis

The survey instrument was used to provide a general context for understanding visitor experiences of natural sounds and to assess visitors' perceived values of natural sounds and the values of those sounds to the park itself.

The park values scale was used as a means of characterizing group trends and assessing possible patterns related to ascribed values for the park and the natural soundscape. Borrie and others (2002) have evaluated the role that park values play in evaluations of management actions. They identified natural values, symbolic and historical values, recreation and tourism values, and personal growth and development values as the primary values visitors perceived for Yellowstone National Park (Borrie and others 2002; Freimund and others 2004). Their study found that individuals who ascribed natural values to the park were more likely to support management restrictions on visitor activities, access, and behavior (Borrie and others 2002; Freimund and others 2004). Please see Appendix B for the park values scale previously used in Yellowstone National Park by Borrie and others (2002) that has been adapted for this study to include a soundscape component.

Four hundred twenty-seven visitors were approached to complete a survey with four hundred-thirteen visitors agreeing to participate in the surveys. Time of day, weather, and visible characteristics of the fourteen visitors who declined participation in the survey were recorded in a non-response chart and analyzed for non-response bias. No patterns explaining non-response were found, thus it is reasonable to conclude that the survey data are not subject to non-response bias. Three locations within the Old Faithful area were used to conduct interviews

(inside the Snow Lodge, outside near Old Faithful Geyser, and both inside and outside the warming huts near Old Faithful Geyser). Surveys were conducted on twenty days spread across the winter season, eleven of which were weekdays and nine of which were weekend days. The potential respondent universe for the soundscape survey was all visitors, eighteen years of age or older, stopping at Snow Lodge and/or Old Faithful from 1/02/08 to 3/09/08. Sample periods were selected to ensure a balance of weekend and weekday periods and a distribution across the total number of days in the winter season. Visitor contacts occurred based upon a pre-designed systematic schedule, starting with the first available group during the sample time. The sampled people were adults (eighteen years of age and older), and were chosen using the next birthday method. This method randomly chooses the member of a group of people who will complete the survey by choosing the group member with the nearest birthday to the date of survey administration. Based on previous studies and visitor use data, every fifth group was eligible and the "next birthday" method was used to determine individual eligibility within a group. Once the surveyor finished with one group, she moved on to the next eligible group that arrived at the survey site. If a group refused to be interviewed, the surveyor then contacted the next eligible group, adhering to the sampling schedule of intercepting every fifth group. Given the use patterns at Old Faithful, the survey was administered between 10:00 AM and 3:00 PM on each sampling day. The data were analyzed using SPSS statistical software to provide basic descriptives statistics, including means and frequency distributions of responses.

3.2.1 Interview Methods: Selection of Participants and the Interview Process

A semi-structured approach to interviews that utilized a series of pre-planned open-ended interview questions, developed in the form of an interview guide, was used in this study. The

interview guide ensured that all the issues relevant to the research were addressed, guarded against wandering off topic, and mitigated the likelihood of awkward pauses and silences that lead to discomfort on the part of both the interviewer and the respondent (Patterson & Williams 2001).

Conducting semi-structured interviews requires integrating structure and flexibility. The researcher needs to address the research questions, while being careful not to exclude the ability to be flexible and improve an individual interview by asking questions that were relevant to understanding a visitor's experience (Patterson et al. 2001). Follow-up and clarification questions were used as deemed appropriate for the individual interview. Please see Appendix A for the complete interview guide.

Forty-five interviews ranging in length from fifteen to twenty-five minutes each were conducted at the Old Faithful area of Yellowstone National Park during the 2007-2008 winter visitation season. Three locations within the Old Faithful area were used to conduct interviews (inside the Snow Lodge, outside near Old Faithful Geyser, and both inside and outside the warming huts near Old Faithful Geyser). Interviews were conducted during the hours of 8:00 am to 8:00 pm during both weekends and weekdays. While forty-five interviews were conducted, some interviews were conducted with couples, resulting in a total of forty-nine individuals being interviewed. The goal was to interview an approximately equal number of visitors from each of the primary visitor activity groups (skiers and snowshoers, snow coach riders, and snowmobilers), to enable the analysis of response patterns both within and across these primary user groups. Of the three major user groups in the park, fifteen interviews were conducted with skiers, seventeen with snowmobilers, and seventeen with snow coach riders. Most respondents interviewed, however, engaged in multiple activities during their visit to the park. Twenty-seven

women were interviewed and twenty-two men were interviewed, ranging from twenty-one to seventy-four years of age. Respondents stayed from one day to five days in the park and were all visitors to the Old Faithful area.

The researcher did all of the interviews, transcribed fifteen interviews personally and employed a professional transcriptionist to complete the other thirty recorded interviews. Once all of the interviews were transcribed, they were listened to a final time by the researcher while reading the transcriptions to check for quality, errors, or disagreements in meaning potentially driven by choices in punctuation on the transcript.

Interviews were then coded and analyzed by the same researcher for primary themes as they related to the primary questions in the interview guide. The activity of categorizing or coding was a "dynamic and fluid process" (Strauss & Corbin 1998, p 101). The idea was to work toward the development of a holistic representation of the soundscape experience phenomena.

During analysis, peer-checks with colleagues were used to critique the development of categories and conceptualizations. Due to the fact that interpretation can continue to develop over time and is an on-going process, it is difficult to tell when the analysis has been completed, but "it is necessary to force an ending at some point" (Rennie 2000, p 487). What is important is that the researcher felt that they had adequately and rigorously addressed the research questions through data analysis and provided a meaningful, justifiable, and useful account of the phenomena. That is when analysis stopped.

3.3 Survey Results

3.3.1 Who were the Visitors Sampled?

Four hundred thirteen visitors to Yellowstone National Park responded to the soundscape survey. Respondents ranged in age from eighteen to eighty-seven years old, with the average age being fifty-one years old. Just over half of the respondents (53%) were male and forty-seven percent were female. Close to half (45%) of all visitors participating in the survey visited the park with family. Thirty percent visited with friends; twenty-seven percent visited with an outfitter or guide group; and six percent visited the park alone. These groups are not mutually exclusive as some visitors may have been in mixed groups or participated in guided activities during a portion of their park visit. Survey respondents spent anywhere from one to ten days in the park, with thirty-seven percent spending one day, fourteen percent spending two days, twenty percent spending three days, and fourteen percent spending five days in the park. Eighty-five percent of visitors surveyed spent between one and four days in the park during their visit. Fifty-seven percent of visitors surveyed toured the park in a snow coach; forty-one percent of visitors snowmobiled in the park, while twenty-six percent of visitors cross-country skied and twenty-five percent went snowshoeing. Again, these categories are not mutually exclusive as many visitors participated in multiple activities while in the park. In fact, fifty-eight percent of respondents participated in multiple activities within the park during their visit. Thirty-three percent of visitors stated their primary activity in the park was snowmobiling, while sixteen percent cited cross-country skiing, eight percent snowshoeing, thirteen percent snow coach touring, eight percent wildlife viewing, and two percent photography. Twelve percent did not cite a primary activity in the park. Respondents lived in 37 different U.S. states widely distributed around the country (Figure 1). Approximately three percent of the respondents were

international. Of the 14 international respondents, six were Canadian, followed in frequency by the Netherlands (4), Germany (2), The United Kingdom (1) and Peru (1).

Table 4-1: General Characteristics of the Old Faithful Visitor Population

Age Range	18-87	
Mean Age	51	
Gender	Male	53%
	Female	47%
Visitor Group	Alone	6%
	Family	45%
	Friends	37%
	Outfitter/Guide Group	27%
Activities Participated in During Park Visit	Snow coach Touring	57%
	Snowmobiling	41%
	Cross-country Skiing	26%
	Snowshoeing	25%
Participated in Multiple Activities		58%
Primary Activity in Park*	Cross Country Skiing	16%
	Snowshoeing	8%
	Snowmobiling	33%
	Snow coach Touring	13%
	Wildlife Viewing	8%
	Photography	2%
Activity on Neighboring National Forests during the same trip	Snowmobiling	26%
	Cross Country Skiing	14%
	Downhill Skiing	17%
	Snowshoeing	12%

Table 4-1 cont.

Highest Level of Education Attained	Some High School	.2%
	High School or GED	5%
	Some College, Business or Trade School	18%
	College Graduate	30%
	Some Graduate School	11%
	Graduate Degree	32%
Place spent most time growing up	On a farm or ranch	11%
	Rural or small town [under 1,000 pop.]	9%
	Town [1,000 - 5,000 pop.]	15%
	Small city [5,000 - 50,000 pop.]	26%
	Medium city [50,000 - 1 million pop.]	22%
	Major city or metro area [over 1 million]	17%
Community where you now live	On a farm or ranch	6%
	Rural or small town [under 1,000 pop.]	7%
	Town [1,000 - 5,000 pop.]	13%
	Small city [5,000 - 50,000 pop.]	25%
	Medium city [50,000 - 1 million pop.]	27%
	Major city or metro area [over 1 million]	21%

N=413

*Twenty percent of the respondents either chose multiple primary activity types or specified an activity not included in the list of response options.

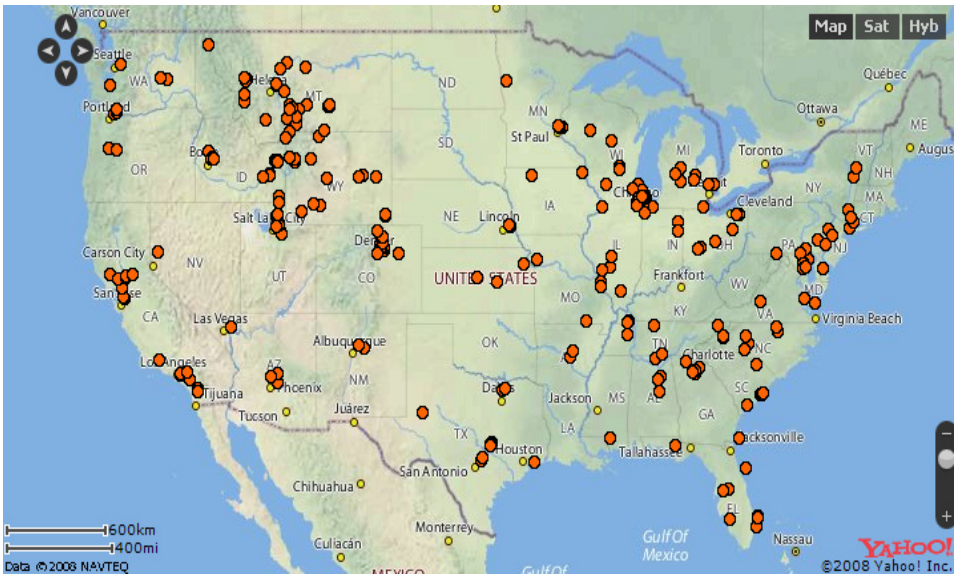
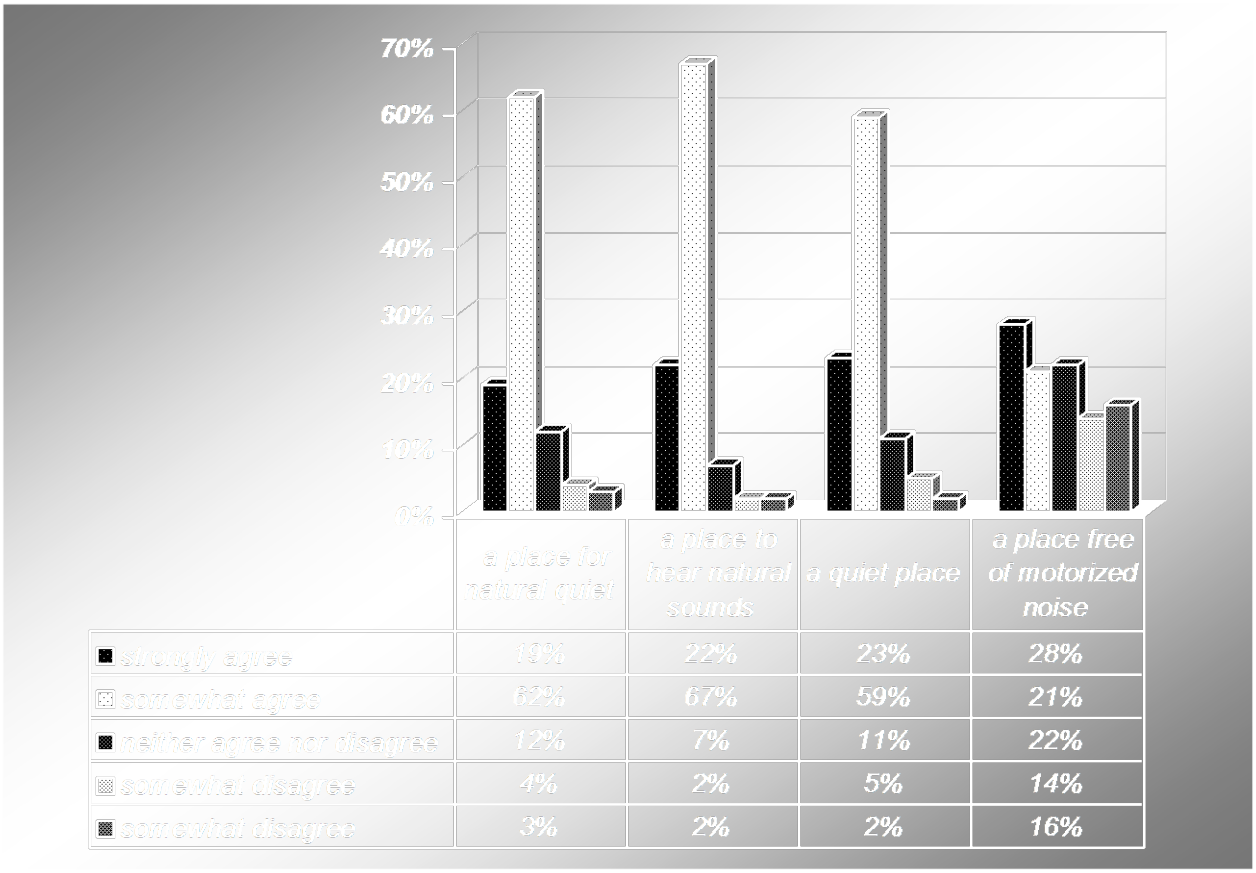


FIGURE 4-1. NATIONAL DISTRIBUTION OF SURVEY SAMPLE. EACH DOT REPRESENTS A RESPONDENT.

3.3.2 How do Natural Sounds fit into the Winter Experience?

The majority of respondents (81%) agreed that Yellowstone National Park is particularly important as "a place for natural quiet" (Figure 4-2) and as "a place to hear natural sounds" (22% strongly agreed, 67% somewhat agreed).



Question wording: Please indicate for each of the following, how much you agree or disagree that they are important to the overall value of Yellowstone National Park.

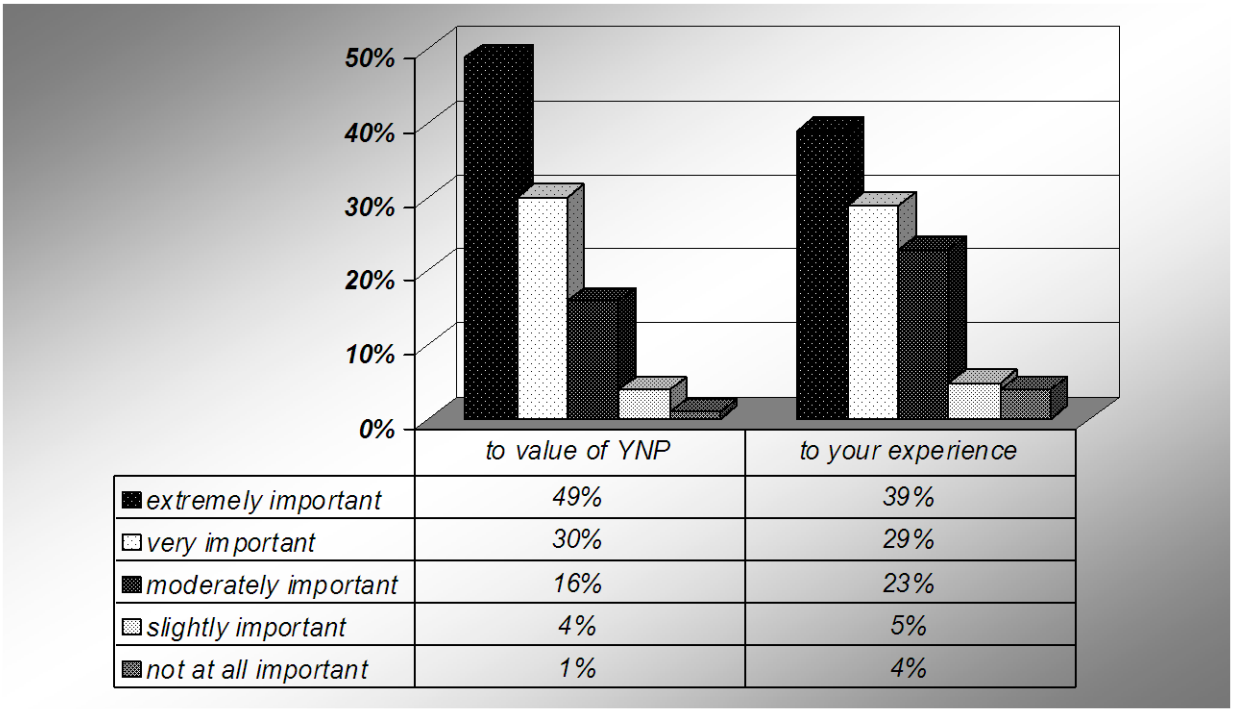
FIGURE 4-2. IMPORTANCE OF NATURAL SOUNDS TO YELLOWSTONE NATIONAL PARK

Ninety percent of visitors responding to the survey agreed that the park was particularly Eighty-two percent of visitors surveyed stated that YNP was particularly valuable as "a quiet place" (23% strongly agreed, 58% somewhat agreed, 11% neutral, 5% somewhat disagreed, 2% strongly disagreed). Summarizing across these three questions, between eighty and ninety percent of visitors stated that natural sounds play a particularly important role in the overall value of YNP.

Just less than half of the visitors surveyed (49%) stated that YNP was particularly valuable as "a place free from motorized noise" (28% strongly agreed, 21% somewhat agreed, 22% neutral, 14% somewhat disagreed, 16% strongly disagreed). Agreement levels were more

distributed on this question, which addressed the necessity of some existent motorized sounds in the park.

Almost all (99%) visitors stated that the opportunities to experience natural sounds were important to the overall *value* of the park (Figure 4-2). Only one percent of visitors surveyed stated that the opportunity to experience natural sounds were "not at all important" to the overall value of the park.



	to value of YNP	to your experience
extremely important	49%	39%
very important	30%	29%
moderately important	16%	23%
slightly important	4%	5%
not at all important	1%	4%

Question wording: Please rate how important the opportunity to experience natural sounds in Yellowstone National Park is to the overall value of the park; Please rate how important it is to your experience today to have the opportunity to experience natural sounds in Yellowstone National Park

FIGURE 4-3. IMPORTANCE OF OPPORTUNITY TO EXPERIENCE NATURAL SOUNDS

Ninety-six percent of visitors stated that opportunities to *experience* natural sounds were important to their experience on the day they were surveyed in the park (39% extremely important, 29% very important, 23% moderately important, 5% slightly important). A minority

of visitors (4%) stated that opportunities to experience natural sounds were "not at all important" to their experience of the park on the day there were surveyed.

3.3.3 Does the importance of Natural Sound Vary by Activity Type?

Fifty-eight percent of visitors participated in more than one type of activity (e.g., snowcoach touring and cross-country skiing). However, when the types of activates engaged in were analyzed, there was a reasonable distribution among Snowcoach Touring (57%), Snowmobiling (41%), Cross-country Skiing (26%) and Snowshoeing (25%). Thus, to differentiate between user types, each of these activity types was analyzed separately (those that did or did not snowmobile, etc.). Therefore, in the following analysis, each of the general questions were compared among those who participated in a particular activity and those who did not. A Chi Square analysis was used to determine statistical differences among those who did and did not participate in each activity. The P values reported reflect the probability that the differences among groupings due to random chance. Due to a lack of independence among the activities (the same person doing multiple activities), no attempt is made to derive an interactive model among activity types.

As mentioned above, the dominant observation among these data is the agreement on the importance of natural sound (Table 4-2). However, there are differences among groups. People who snowmobiled agreed less strongly that Yellowstone is "a place for natural quiet" X^2 (4, n=400) = 17.110, p < 002 and "a place to hear natural sounds." X^2 (4, n=401) = 21.052, p < .001. When evaluating YNP as a "quiet place," those who rode snowmobiles were less likely to agree X^2 (4, n=397) = 19.390, p < .001 than those who did not ride a snowmobile. When asked if Yellowstone is "a place free of motorized noise", there were significant differences for each

activity type: snowmobilers are less likely to agree with this statement X^2 (5, n=398) = 39.994, p < .000 while snowshoers X^2 (5, n= 397) = 18,569, p < .002, snowcoach riders X^2 (5, n=397) = 19.704, p, .001and cross country skiers were more likely to agree X^2 (5, n=396) = 22.019, p < .001.

Table 4-2: Importance of Natural Sounds to Value of YNP by Visitor Primary Activity

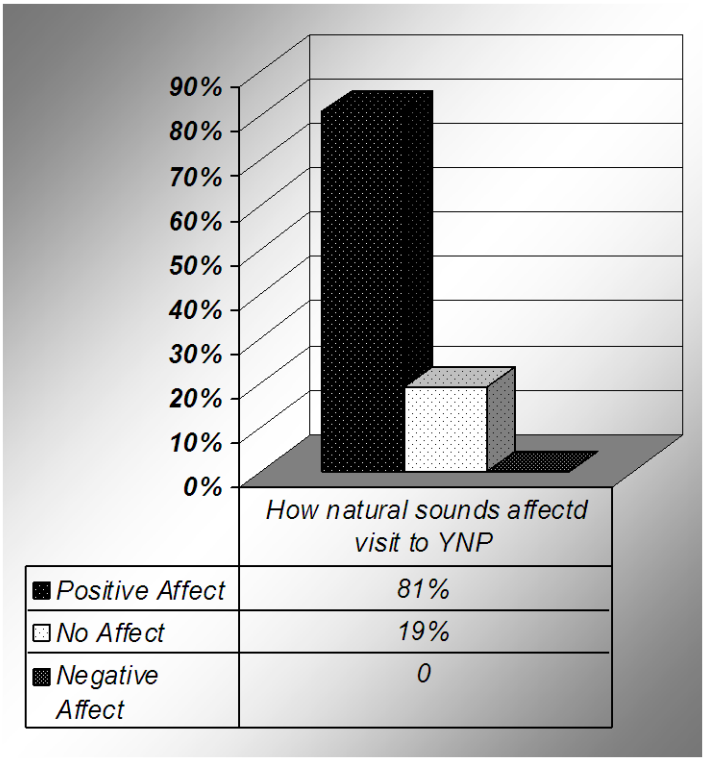
	Strongly Agree	Somewhat Agree	Neither Agree nor Disagree	Somewhat Disagree	Strongly Disagree	N
	A place for natural quiet					
Cross-Country Skiing	71%	15%	10%	2%	2%	74
Snowshoeing	70%	14%	11%	3%	2%	101
Snowmobiling	51%	25%	15%	5%	4%	166
Snow coach Touring	67%	16%	12%	3%	2%	233
	A place to hear natural sounds					
Cross-Country Skiing	72%	20%	4%	2%	2%	104
Snowshoeing	71%	20%	3%	4%	2%	101
Snowmobiling	58%	27%	11%	1%	3%	167
Snow coach Touring	71%	20%	4%	3%	2%	233
	A quiet place					
Cross-Country Skiing	72%	20%	4%	3%	2%	102
Snowshoeing	68%	21%	4%	5%	2%	101
Snowmobiling	47%	26%	17%	7%	4%	166
Snow coach Touring	62%	23%	8%	4%	2%	233
	A place free of motorized noise					
X-Country Skiing	45%	21%	17%	9%	9%	101

Table 4-2 cont						
Snowshoeing	42%	20%	22%	9%	7%	100
Snowmobiling	14%	19%	26%	16%	24%	167
Snow coach Touring	33%	22%	20%	15%	10%	231

Table 4-3: Importance of Opportunity to Experience Natural Sounds by Visitor Primary Activity

	Extremely Important	**Very Important**	**Moderately Important**	**Slightly Important**	**Not at All Important**	**N**
	Please rate how important the opportunity to experience natural sounds is to the overall value of YNP					
Cross-Country Skiing	63%	29%	8%	0%	0%	103
Snowshoeing	63%	27%	7%	3%	0%	100
Snowmobiling	36%	31%	26%	5%	2%	169
Snow coach Touring	55%	30%	10%	5%	0%	232
	Please rate how important it is to your experience today to have the opportunity to experience natural sounds in YNP					
Cross-Country Skiing	52%	32%	15%	0%	1%	103
Snowshoeing	53%	28%	15%	1%	3%	100
Snowmobiling	25%	30%	30%	7%	8%	170
Snow coach Touring	46%	29%	19%	4%	2%	233

In terms of visitors' actual experience of natural sounds during their visit to Yellowstone National Park, the majority (81%) of visitors surveyed stated that natural sounds had a positive effect on their visit (Figure 4-3). The remaining nineteen percent of visitors stated that natural sounds had no effect on their visit to the park.



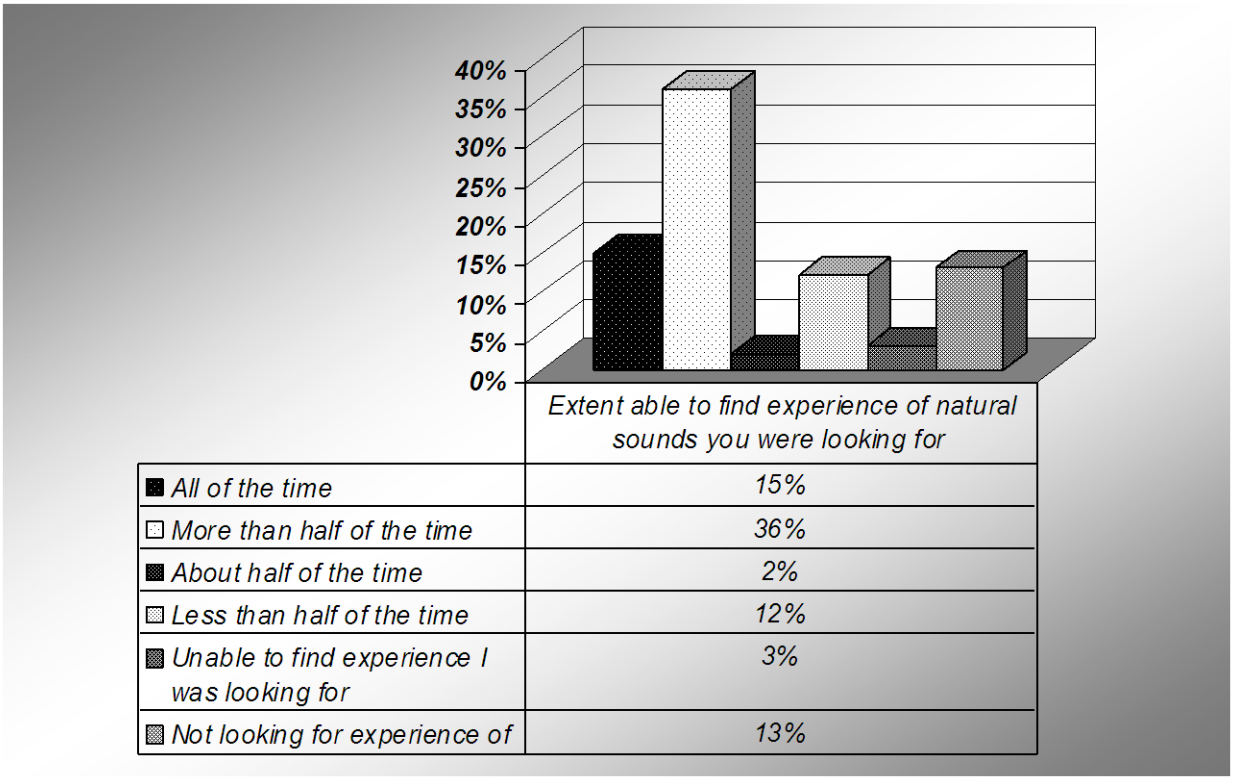
*Question wording: Please rate how natural sounds affected your **visit** to Yellowstone National Park*

FIGURE 4-3. NATURAL SOUNDS AND SATISFACTION

When visitors were asked to state the extent to which they were able to find the experience of natural sounds that they were looking for in Yellowstone National Park, the majority (71%) were able to find it half of the time or more (15% all of the time, 36% more than half of the time, 20% about half of the time). Three percent of visitors were unable to find the experience of natural sounds they were looking for. A minority of visitors surveyed (13%) stated they were not looking for any experience of natural sounds.

While just fifteen percent of visitors were able to find the experience of natural sounds they desired all of the time while in the park, satisfaction with the experience of the park's natural sounds remained high Figure 4.5. Eighty-three percent of visitors were satisfied with

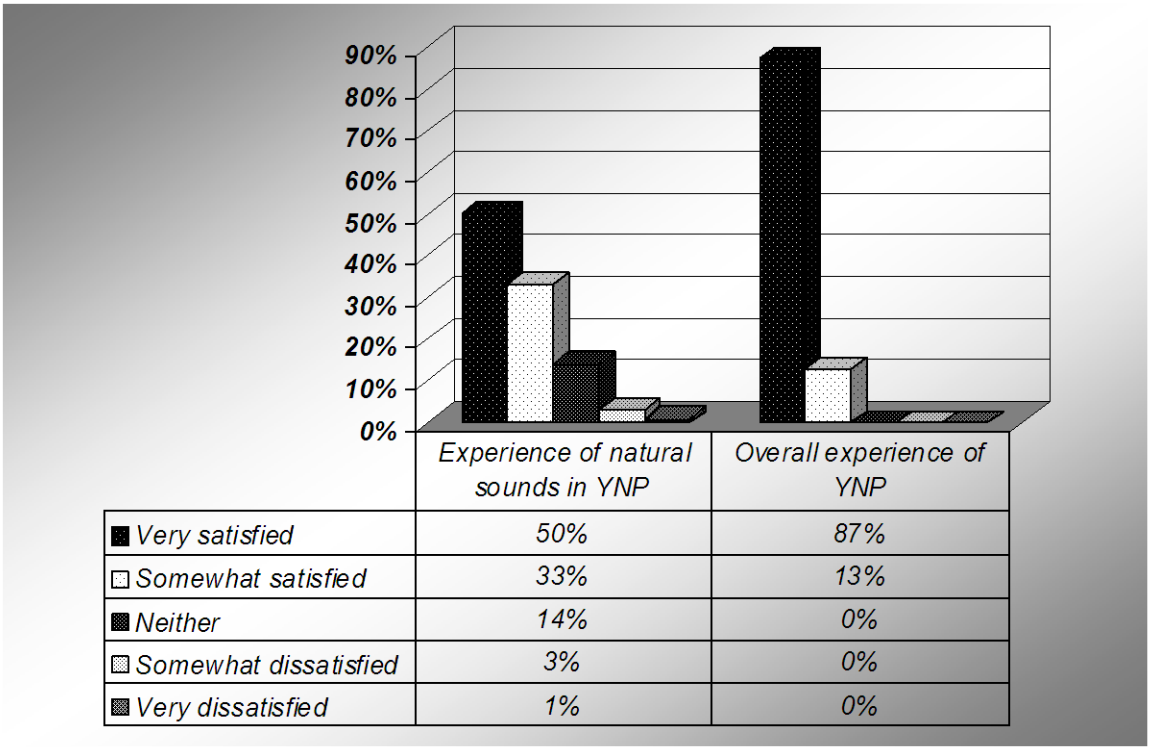
their experience of the park's natural sounds (Figure 4-5). Results reported in Figure 4-5 also suggest that visitors' satisfaction with the overall experience of the park was high, with one hundred percent of visitors stating that they were either very satisfied (87%) or somewhat satisfied (13%).



	Extent able to find experience of natural sounds you were looking for
All of the time	15%
More than half of the time	36%
About half of the time	2%
Less than half of the time	12%
Unable to find experience I was looking for	3%
Not looking for experience of	13%

Question wording: To what extent were you able to find the experience of natural sounds that you were looking for in Yellowstone National Park?

FIGURE 4-4. ABILITY TO EXPERIENCE NATURAL SOUNDS



	Experience of natural sounds in YNP	Overall experience of YNP
Very satisfied	50%	87%
Somewhat satisfied	33%	13%
Neither	14%	0%
Somewhat dissatisfied	3%	0%
Very dissatisfied	1%	0%

Question wording: How satisfied are you with your experience of the park's natural sounds?; How satisfied are you with your overall experience of Yellowstone National Park?

FIGURE 4-5. SATISFACTION WITH NATURAL SOUNDS AND YELLOWSTONE

3.3.4 Does Satisfaction with the Natural Sound Experience Vary by Activity Types?

Looking at responses across visitor activity type in the park, it is clear that natural sounds had a dominantly positive effect on all activity types (Table 1-4). There are, however slight differences between those who did and did not participate in each activity. While natural sound was positive for almost all of the cross country skiers and snowshoers, twenty-eight percent of the snowmobilers identified natural sound as having a negative effect on their experience indicating that visitors are slightly more discerning about their experience than their overall visit to the park as indicated in figure 4-3.

Table 4-4: Natural Sounds and Satisfaction by Visitor Primary Activity

Activity	Had a positive Effect %	Had a negative Effect %	N
Snowmobiling	71*	28	170
Cross Country Skiing	96	4	102
Snowshoeing	93	7	101
Snowcoach touring	88	12	233

*Percent of respondents within activity type.

The desired experience of natural sound was also quite accessible to the respondents regardless of activity type (Table 4-5). Snowmobilers were most likely to find the natural sound they desired all the time X^2 (4, n=403) = 33.477, p < .000. They were also the most likely to not be looking for natural soundscape in their experience X^2 (4, n=404) = 36.734, p < .000. Cross country skiers X^2 (4, n=401) = 18.285, p < .001 and snowshoers X^2 (4, n=402) = 13,591, p < .009 were more likely to experience natural soundscapes all or half of the time than those who did not ski or snowshoe in the park and were less likely to indicate that natural sounds were not what they were looking for in their experience X^2 (4, n=402) = 21.265, p < .000 X^2 (4, n=403) = 14.599, p < .006 respectively.

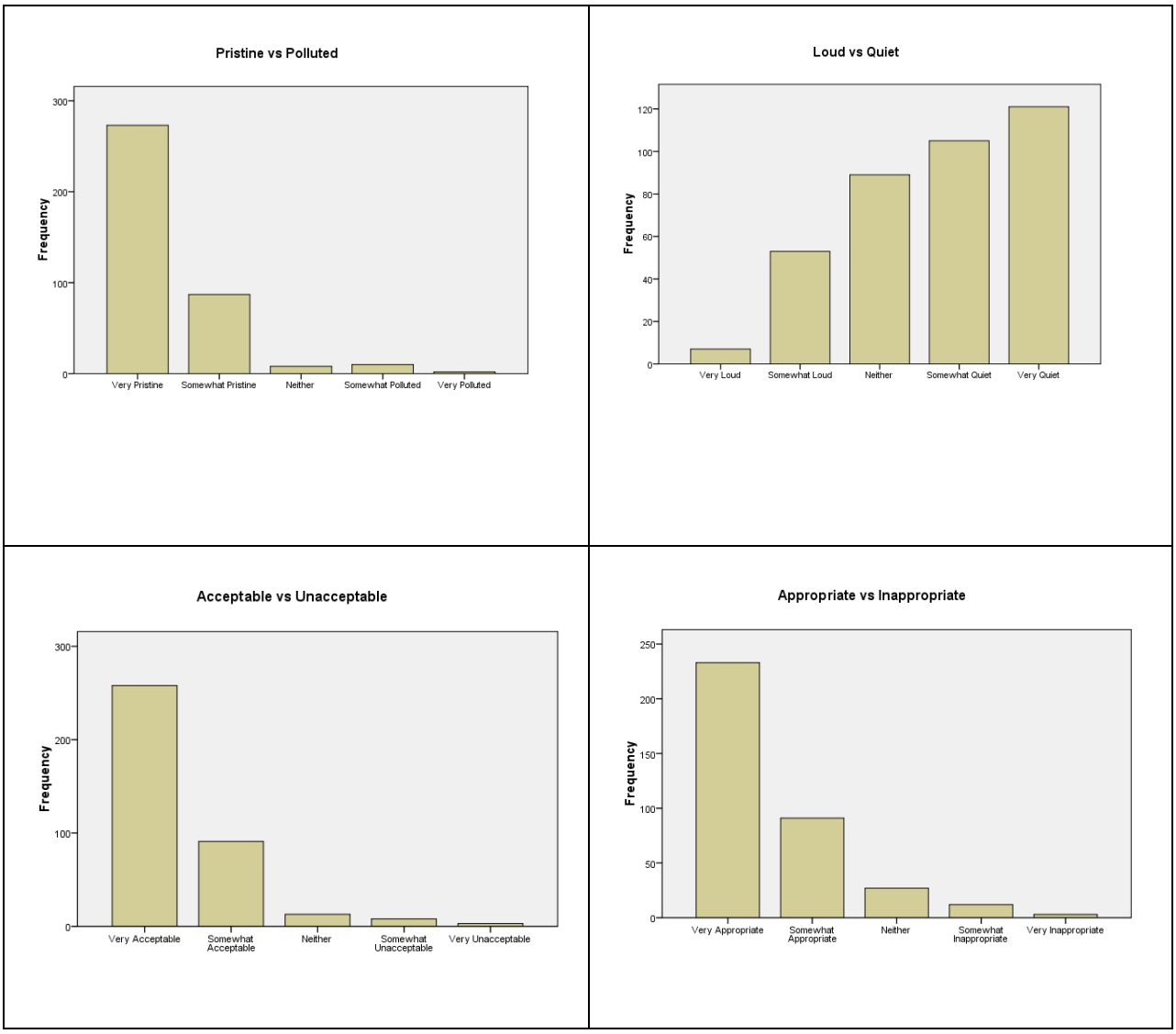
Table 4-5: Ability to Find the Desired Experience of Natural Sound by Activity Type.

Activity	All the time	More than Half the time	About Half the time	Less than Half the time	Unable to find the Experience of Natural Sound	Not Looking for any experience of natural sound	N
Snowmobiling	**22***	**28**	**16**	**12**	**2**	**20**	**165**
Cross Country Skiing	**16**	**51**	**21**	**6**	**1**	**6**	**103**
Snowshoeing	**14**	**46**	**24**	**11**	**1**	**4**	**100**
Snowcoach touring	**12**	**43**	**23**	**12**	**2**	**9**	**230**

*Percent of respondents within activity type.

3.3.5 How Do Visitors Evaluate the Winter Setting in Yellowstone?

Respondents in this study predominantly found the Yellowstone environment pristine, quiet, appropriate and acceptable (Figure 4-6). In addition, when asked about their satisfaction with the setting, sixty-six percent of the visitors found the setting "Very Satisfying", and another ten percent found it "Satisfying". Four percent of the sample checked an option that was either somewhat or very dissatisfying.



Question wording: For each of the word pairs below, please check the box that best represents your impression of the winter setting at Yellowstone National Park.

FIGURE 4-6. RESPONDENT APPRAISALS OF THE YELLOWSTONE WINTER ENVIRONMENT.

3.3.6 Do Visitors Support Current Management Policies to Protect Natural Soundscapes?

Respondents were asked about their support for a variety of potential management actions "to protect opportunities to experience natural sounds." Requiring best available technology, continuing to require guides, limiting the total number of snow machines in the park

per day and limiting group sizes to 11 per guide were strongly supported by a minimum of sixty-eight percent of the respondents (Table 4-6.). Closing the roads to all over snow vehicles or to snowmobiles only was opposed or strongly opposed by a majority of the respondents. Plowing the roads for automobile access was strongly opposed by seventy-one percent of the respondents and opposed by another nine percent.

Table 4-6: Support for Management Actions by Visitor Primary Activity in Park

Primary Activity	Strongly Support	Somewhat Support	Neither Support nor Oppose	Somewhat Oppose	Strongly Oppose	N
	Continue to Require Best Available Technology					
Cross-Country Skiing	91*	5	2	0	2	103
Snowshoeing	91	7	1	0	1	102
Snowmobiling	70	18	7	4	2	166
Snow coach Touring	86	10	2	0	2	231
Total Sample	80	13	4	2	3	400
	Continue to require guided tours for snowmobiles and snowcoaches					
Cross-Country Skiing	80	13	4	1	3	104
Snowshoeing	83	12	2	2	2	103
Snowmobiling	57	21	6	7	8	166
Snow coach Touring	77	13	3	3	3	232
Total Sample	71	15	5	5	5	401

Table 4-6: continued.

Primary Activity	Strongly Support	Somewhat Support	Neither Support nor Oppose	Somewhat Oppose	Strongly Oppose	N
	Continue to limit total number of snowmobiles and snowcoaches entering the park per day					
Cross-Country Skiing	89	5	3	2	2	104
Snowshoeing	85	7	2	6	1	103
Snowmobiling	52	24	7	11	7	166
Snow coach Touring	80	10	3	4	4	231
Total Sample	71	14	4	6	5	400
	Continue to limit snowmobile group sizes to a maximum of 11 with 1 guide					
Cross-Country Skiing	85	7	5	0	3	103
Snowshoeing	81	11	4	2	2	102
Snowmobiling	52	23	12	6	7	166
Snow coach Touring	75	13	6	1	5	229
Total Sample	68	15	9	3	5	398

Table 4-6: continued.

Primary Activity	Strongly Support	Somewhat Support	Neither Support nor Oppose	Somewhat Oppose	Strongly Oppose	N
	Close roads to all over snow vehicles					
Cross-Country Skiing	4	9	9	26	53	101
Snowshoeing	3	5	11	27	55	102
Snowmobiling	7	4	10	17	62	166
Snow coach Touring	4	4	11	21	60	229
Total Sample	6	5	11	20	57	395
	Close roads to snowmobiles and allow snow coach tours					
Cross-Country Skiing	22	21	14	17	26	104
Snowshoeing	25	14	18	18	24	103
Snowmobiling	6	5	13	14	62	166
Snow coach Touring	19	12	15	19	35	230
Total Sample	15	11	14	17	42	397
	Plow all roads and allow automobile access to YNP (no over snow vehicles)					
Cross-Country Skiing	5	5	3	5	83	104
Snowshoeing	3	3	1	9	85	103
Snowmobiling	9	6	12	12	62	165
Snow coach Touring	5	7	4	9	76	230
Total Sample	7	6	7	9	71	398

Table 4-6: continued.

Primary Activity	Strongly Support	Somewhat Support	Neither Support nor Oppose	Somewhat Oppose	Strongly Oppose	N
	Close roads to snowmobiles and allow snow coach tours					
Cross-Country Skiing	22	21	14	17	26	104
Snowshoeing	25	14	18	18	24	103
Snowmobiling	6	5	13	14	62	166
Snow coach Touring	19	12	15	19	35	230
Total Sample	15	11	14	17	42	397
	Plow all roads and allow automobile access to YNP (no over snow vehicles)					
Cross-Country Skiing	5	5	3	5	83	104
Snowshoeing	3	3	1	9	85	103
Snowmobiling	9	6	12	12	62	165
Snow coach Touring	5	7	4	9	76	230
Total Sample	7	6	7	9	71	398

*percent of respondents within activity type

3.4 Interview Results

3.4.1 How did visitors describe the role of natural sound in their experience?

The interview data contain meaningful descriptions given by the majority of respondents when characterizing their experiences and the meaning of the experiences of natural sounds. Several visitors described a deep sense of *presence* or *being* as a result of their experience of

natural sounds in the park. The experience of both the natural sounds of the park and the unique quiet of Yellowstone were described as assisting in centering visitors, allowing them to focus and connect with the present moment (T4.7 James, T4.7 Kim, and T4.7 David). The experience of natural sounds invoking a sense of presence was a theme that recurred in several interviews and attested to a deep psychological experience entered into through the experience of natural sounds in the park.

While some respondents described a sense of being centered and connected to the present moment, the experience of being deeply connected to nature was also explicitly described by many visitors in each of the three primary user groups. Visitors connected the natural sounds of the park with the experience of the natural world (T4.7 Amy, T4.7 Lou, and T4.7 Lisa). For some, experiencing the natural sounds of the park was a powerful way of communing with nature. Visitors connected hearing the natural sounds of the park with a visceral experience, where sounds were gateways into experiencing the primordial or ancient character of the park. Visitors also described natural sounds as having a restorative effect on them. Characterizing the experiences of natural sounds as something that induced calm and peace was a common theme (T4.7 Mark, T4.7 Mary). Some visitors distinctly described hearing the sounds of the park in spiritual terms characterizing natural sounds as "God's sounds" or "holy sounds" (T4.7 Allison, T4.7 Craig). Natural sounds in this sense were considered sacred both in terms of their inherent quality and as an aspect of experiencing them.

Table 4-7: Interview Excerpts: Visitor Characterizations of the Experience of Natural Sounds

T4.7 James	SK-R*	***[Presence 44%**]*** " The more you pay attention to the sounds of the park, the more you know where you are; it's calming and centering. You tune in and focus on where you are, what you're looking at, you know? You can hear every little sound because it's so quiet and being able to hear those sounds and that silence, I feel really connected to the present moment. There are no distractions and my mind is clear and totally connected to right where I am and what I'm doing. That's really powerful."

T4.7 Kim	SK-F	"The sounds of the park…when I really started to notice them it was like I was transported to this very stable place in myself. Your mind is clear and the quiet puts you in really solid mental state. It's hard to describe really. I felt completely involved in everything I was seeing and doing. I felt more attentive to what I was doing and where I was. There weren't any distractions, nothing pulling my mind to other thoughts. There is a lot of clarity, no hesitation or worry, in those moments when I think about it now.
T4.7 David	SM-F	"I've never heard [the sound of the geysers] before. It was so powerful and such a strong sound. It really made you pay attention to where you were and to everything you were doing. And the quiet is really striking. You can hear everything, every crunch of snow, your breath, and I felt totally tuned in to everything around me."
T4.7 Amy	SK-R-L	***[Deep Connection to Nature 62%]*** "Listening to the sounds of the park, the quiet, the wind blowing, the crunch of the snow, the sounds are part of being right there in the elements, connected to the wilderness. It's like you're hearing the pulse of the earth, the heartbeat of nature, the purity and power of the natural world."
T4.7 Lou	SC-F	"The sounds are so pure and pristine. The sounds of nature and the quiet here are just part of the wild beauty of Yellowstone. Hearing those sounds is like getting back to nature, a kind of reunion with the natural world."
T4.7 Lisa	SM-F	"The quiet and just the other sounds that you hear--wind, geysers, birds, whatever, and it being winter so it's is so quiet. I feel like it's such a wild place, so remote. I think that hearing the sounds of the park, for me, sparked a kind of renewed relationship with the wilderness, with nature. It's not the whole thing, of course, but hearing the quiet was so special. It plays a part in feeling like you're really experiencing nature."
T4.7 Mark	SC-R	***[Restorative 55%]*** "Hearing the sounds, the silence, and the sounds of nature, you feel like you're home, in a safe place, where you just know you're okay and supposed to be. The sounds of the park are so pure and comforting like that. You feel at peace when you hear the sounds of nature"
T4.7 Mary	SM-F	"When I start to notice the sounds of the park, it's really relaxing and calming. After a while you start to feel refreshed and renewed in a way. Your mind feels clearer and just refreshed."
T4.7 Allison	SK-R-L	***[Spiritual 10%]*** "When you're out there and you hear the sounds of nature, whether it's the quiet or the geysers or whatever, you're hearing God's sounds, holy sounds. It's really profound."

T4.14Craig	SM-F	"You know, when you get to hear the sounds of nature here, whether it's the wind or the water bubbling from the geysers or just the quietness of it all, you know you're in a special place. It's actually quite personal, but it can really be a sort of spiritual thing for me and the sounds are a part of that. I can't separate the sounds out of that kind of experience that I've had here."
T4.7 Ryan	SK-R	***[Valuable Contrast to Civilization 36%]*** "The sounds here [Yellowstone National Park] makes you realize how different this place is from other places outside the park. We need to have places apart from the constant drone of urban noise. You need that peace and that reminder of what the world is like away from civilization.
T4.14Mary	SC-F	"We were actually talking about this earlier. I'm really grateful that we do have a protected place, because if we want to hear noises, we want to have more of those "civilization comforts" like being able to have, use snowmobiles without restriction or this or that, go to one of the cities around, because they're there and then you can do that. But I really think it's important to have a place that's not like that civilization, that city life. I mean, it's, it is the most important thing, it's the wilderness experience and places like Yellowstone are the only places where we even have a chance to experience it. So it's really important to me that the sounds of the wilderness be protected in the park. There should be a lot of places in the park where it sounds natural—no machines, you know?"
T4.7 Tiffany	SM-F	***[Reminder of How to Listen 32%]*** "What you get to hear in the park, it sets a new baseline and makes you aware of all the noise in your daily life. It reminds you of what's important, just the act of listening, something that folks don't do anymore. I don't even think I knew what quiet was until I came here. It reminds me that I should really listen more to the world around me, even when I get home."
T4.7 Jordan	SK-F	"Listening to things that you get to hear here in the park—just the normal sounds of nature, it's just not something people do much anymore and it's a real shame. People need to be reminded of the importance of just listening and hearing the world around them. That's definitely something I'm taking back with me from this visit. It's one of the things I like about spending times outdoors."

**Key:*

SC = Snow coach Rider R = Repeat Winter Visitor L: Local Resident

SK = Skier/Snowshoer F = First Time Winter Visitor

SM = Snowmobiler

** The percentage represents the percent of the interviewees that provided insight to this theme. It is not intended to provide a quantitative analysis but rather to demonstrate the relative prevalence of the various themes within the sample of interviewees.

Several visitors interviewed also noted the experience of natural sounds as a valuable explicit contrast to civilization. The value of having places like Yellowstone to experience natural sounds, away from one's common urban lifestyle was a common theme in the interviews (T4.7 Mary, T4.7 Ryan). Visitors noted the importance of hearing natural sounds in the park frequently as one's only opportunity to experience those sounds or in some cases, a salient reminder of what the sounds of nature are as contrasted to development outside the park. Responses of this nature tended to more commonly come from interviewees who were not local residents, lived in urban areas, and likely stem from the fact that local residents may be less associated with highly urban environments. Connecting the unique opportunity to hear the natural sounds of Yellowstone with the value of the park and the quality of the park experience was typical of many respondents across all user groups.

Further, for some, the experience of natural sounds was a call or a reminder of the importance of listening in one's daily life. Some respondents described experiencing the sounds of the park as setting a new "baseline" to which one could compare how they listen and what they listen to in their lives outside of the park (T4.7 Tiffany, T4.7 Jordan). Again, these respondents within our data set were more likely to be residents of non-local urban areas and described hearing the sounds of the park as distinctly different from their typical urban lives, providing a unique contrast and recognition of the urban sounds in which modern lives are typically embedded. Further, listening to the sounds of the park provided an opportunity for them to evaluate how well and how frequently they listen to the world around them in their daily lives. This process of frequently recognizing that the very act of listening was something they did not engage in as frequently or as diligently as they did while in the park served as a platform for reflection and instilled a desire to bring some of their more attentive park listening back into

their regular urban lives. In this case, while the park sounds serve as a clear contrast to the sounds of visitors' daily lives, they also provided an opportunity to incorporate some of the value of listening and attentiveness to natural sounds back into one's life upon return from the park.

3.4.2 Detailed Exploration of the Importance of Natural Sounds to Visitors

The previous section documented specific meanings and characterizations of visitor experiences of natural sounds in Yellowstone. This section looks at the extent to which visitors considered natural sounds to be important to their overall experience. In many of the interviews, respondents noted quiet as one of their primary reasons for visiting Yellowstone National Park in the winter season. These perspectives tended to originate from repeat visitors to the park who had expectations from prior experience in the park or participating in winter recreational activities in the area. In every case, this description came up before any questions particularly related to natural sounds arose on the part of the interviewer. In fact, responses containing reference to quiet or silence were common responses to the question, "Why did you decide to come to Yellowstone in the winter?" or "What attracted you to visit Yellowstone in the winter?" Hearing the natural sounds and the quiet of Yellowstone was a motivation for visiting the park for several visitors (T4.8 Allison, T4.8 Joelle). While many visitors articulated quickly and early in the interview that the natural sounds and the unique quiet of the park were a motivation for their visit, others noted that it was an unanticipated, yet significant aspect of their experience (T4.8 Marlene, T4.8 Tiffany). In every case, this unanticipated, yet significant experience of natural sounds was described by visitors experiencing the park for the first time. These differences among repeat visitors who are familiar with Yellowstone in the winter contrasted to those who were visiting Yellowstone or any wilderness area for the first time. Regardless, both

types of visitors noted that hearing the natural sounds of the park was an essential component of their overall positive experience of the park and in some cases constituted the motivation for their visit.

While there are differences in views described throughout this section, the general patterns were that all skiers believed natural sounds were important to their experience, with snow coach riders following as a close second. The majority of snowmobilers interviewed also believed natural sounds to be important to their experience, but there was a greater likelihood of a snowmobiler stating that natural sounds were not important to them personally than someone of another primary activity group.

Table 4-8: Interview Excerpts: Importance of Natural Sounds to Visitor Experiences

T4.8 Allison	SK-R-L	***[Motivation for Visit 68%]*** "Being able to hear the natural sounds, and especially the quiet in the park, is one of the main reasons I came here in winter."
T4.8 Joelle	SM-R	"Oh, knowing that the park is going to be quiet is one is a huge reason that I like to come here. I really love the way the park sounds in winter. It's pretty quiet out there on the trails and you really can hear every little thing. I love that."
T4.8 Marlene	SC-F	***[Unanticipated, but Significant 34%]*** "You know, to be honest, I didn't really think too much about the park sounds before I came here, but it's funny we're talking about it because I noticed the sounds right away. The powerful geysers and hearing such crisp sounds as you walk around, it was actually really important to me. I couldn't imagine having a real experience of the park without having heard those sounds of nature here."
T4.8 Tiffany	SM-F	"If you had asked me two days ago before I actually got here, I would have said, "no" because I really didn't even think about sounds when I was planning my trip here. Now that I've been here for a couple of days, though, all of the sounds of the park are really important and definitely had a positive impact on my experience here. In some ways, there aren't really very many sounds, but the sounds you do here are really striking and add to the character of the park. I can't imagine talking about my time here in the park now without at least mentioning what it was like to sometimes hear no sounds at all and then at other times here the water being pushed up from the center of the earth. It's pretty wild."
T4.8 Craig	SM-F	***[Inseparable Part of Experience 8%]*** "I don't think I can really answer how important the sounds were to my experience. It doesn't make sense to think of sounds as a separate thing; it's part of the whole package of being here. That said, if I didn't have the opportunity to hear those natural sounds, I think my time in the park wouldn't be as

		special."
T4.8 Jack	SC-R-L	"Hearing the sounds of the park is just part of what it's like to be here. Unless you're inside, it's just what the park is. It's really hard for me to talk about just the role of the sounds in my experience here. The sounds are part of the whole natural experience of the park."
T4.8 Melissa	SC-F	***[Separable from Experience, but Valuable 15%]*** "That [natural sounds] doesn't affect me personally. I came here to see the wildlife, to photograph wildlife. But I still want the park to have natural sounds, to be a natural place. I think the sounds are part of the wildlife habitat and so if there was too much noise from vehicles, it would affect them [the wildlife], and then it would ultimately affect my experience."
T4.8 Ethan	SM-R	"The sounds… they're not really a big thing for me. It's mostly quiet here anyway. When I think of my time here in the park, I think about the land, the incredible amount of snow, the buffalo, and the geysers…but of course I want the park to protect the sounds that do exist here and even the quiet, because they are a part of the whole environment, the natural environment here. I'm sure if there was too much outside noise here, then it would affect the animals here too. You know, they probably wouldn't be so easy to see."
T4.8 Ronald	SC-F	***[Not Important to Experience 6%]*** "I don't think hearing the sounds of the park are really important to me. It didn't affect my experience at the park. I came here to see the park, not hear it."
T4.8 Emma	SM-F	"The sounds? No, not really. I've never even thought about it and I don't think I could say they're an important part of why I'm here. I don't think of natural sounds when I think of my visit here."
T4.8 April	SM-R	"Um, no. What sounds do you mean? There aren't really any sounds here. I mean, when you're on the snowmobile you can't hear anything anyway. The fun of it is more in seeing the park. So, no sounds really weren't a big thing for me. If anything it was kind of loud riding on the snowmobile the whole day."

While some visitors were able to talk comfortably about the role that natural sounds played in their overall experience, some visitors noted how difficult it was to talk specifically about natural sounds, given that they were an inseparable part of their overall park experience (T4.8 Craig, T4.8 Jack).

In contrast, however, other visitors interviewed noted that natural sounds were not an important part of their personal experience of the park, but were clear to comment that the

sounds themselves are valuable to the park overall regardless of how it impacted them personally on this visit (T4.8 Melissa, T4.8 Ethan). Several visitors also noted the role that natural sounds play as part of the wildlife habitat and expressed the importance of protecting natural sounds as part of that habitat (T4.8 Melissa, T4.8 Ethan). Only a few visitors interviewed did not consider natural sounds to be an important part of their experience (T4.8 Ronald, T4.8 Emma, T4.8 April). These visitors noted their motivation for visiting the park such as wildlife photography or simply "seeing the park" rather than an aspect of the park experience that related to hearing natural sounds. For this contingency of visitors, natural sounds were simply not considered an important element of their overall experience in the park. They were all either snowmobilers or snow coach riders. However, what became clear throughout the interviews, even with the contingent of visitors who did not consider natural sounds to be a valuable part of their personal experience of the park, was that every visitor interviewed attested to the value of natural sounds as a part of the overall value of Yellowstone as a whole. In other words, regardless of whether natural sounds were an important aspect of a visitor's personal experience in the park, every visitor interviewed indicated that natural sounds were important to the overall value of Yellowstone and should be protected. The next section describes visitor characterizations of the importance of natural sounds to the park as a whole.

3.4.3 What are Visitor Perspectives on Natural Sounds and the Park Winter Setting?

Natural sounds were considered essential to the character of Yellowstone in all 45 interviews conducted. Visitors described natural sounds as an important and unique characteristic of the park in the winter and they described a hypothetical loss of these sounds in the park as a loss of the essence of the park (T4.9 Stacie, T4.9 Rick). One visitor, for example,

noted that Yellowstone is a special place that should be protected from too many technological sounds, particularly during the winter season (T4.9 Erin). The winter setting was frequently described as particularly distinctive as a place to experience a season of rest and peace and also as a haven for silence that is unique to the park setting (T4.9 Erin, T4.9 Joesph, T4.9 Lisa).

Table 4-9: Interview Excerpts: Importance of Natural Sounds to the Park Setting

T4.9 Stacie	SM-R	***[Essential to Park Character 100%]*** "If you lost the natural sounds, then you'd lose what makes this place special."
T4.9 Rick	SC-R	"When you stop and hear those sounds, then you start to really feel what it's like to be in this park. You pay attention to the place, to what this place is. You start to understand this park and what makes is such an incredible place. There's no place like it. There's no place you can hear the sounds of nature like you can here whether it's the bison pushing the snow, your skis swooshing through the snow, or the gurgling of the geysers. There's just nothing like it, and the sounds are definitely a big part of that."
T4.9 Erin	SK-F	"You know, winter is really special here. Nature needs time to rest and winter is that time. The park shouldn't be a place overrun with technological sounds, "
T4.9 Joseph	SC-R-L	***[Winter Silence as Unique to Park Setting 88%]*** "It wouldn't be Yellowstone in the winter without the sounds, and especially without the quiet."
T4.9 Lisa	SM-F	"The sounds of the park are one of the things that make it so unique. For me, the quiet, the unbelievable quiet is one of the really amazing things about it."
T4.9 Jason	SC-F	***[Silent/Natural Sound Contrast as Distinctive 48%]*** "One of the nice things about winter in the park are the contrasts. The contrasts of quiet and other sounds are more vivid in the park. And the more people are exposed to sounds, the less sensitive they are to any sound. In other words, the more you live in a city with constant noise, the less sensitive you are to sounds in general. So when you get out here in the park and it's snowing and it's very, very, quiet, then it's like a new level of sensitivity to everything. So you appreciate sounds that you would never hear in the city. I mean, you wouldn't even hear some of the things that we have heard. And the sounds are so distinct, so clear, so noticeable because there's so much quiet in the background."
T4.9 Kim	SK-F	"It's unbelievable how quiet it is here sometimes. It's so quiet you can hear every little thing. It makes every sound so crisp and noticeable. When I was snowshoeing the crunch of the snow seemed so loud, you kind of tried to snowshoe quieter because it really was such a contrast to the natural silence of the park."
T4.9 Miriam	SC-F	***[Yellowstone as a Guardian of Natural Sounds 100%]*** "Here you have the chance to hear this incredible wilderness, the quiet, the wind, the ruggedness, and it's so important that that the chance to hear the natural sounds are protected for present and future generations. You know, if we lose the things that make this place so special, such a unique environment, then we lose that forever."
T4.9 Craig	SM-F	"The sounds are definitely part of the special character of the park. Winter really is a quiet time, it's a season of rest and it's nice to know that we have places like Yellowstone where you can still go and hear what nature sounds like without all of our normal high tech, modern aspects to it. We need to have protected places like our parks so that as technology advances—and it will, we all know that, that our kids and generations to come will have a chance to know what it was like here in a more natural state before all of that progress. Don't get me wrong, I have my iPod and cell phone and I'm not going to go give up my house back home or anything, but I do think it's important that we have these kinds of havens where we can see and hear nature."

The particular role of quiet in the park during winter was noted by several visitors as providing a critical contrast to more urbanized settings in allowing visitors to hear the natural sounds more distinctly, which was seen as a unique feature of the park (T4.9 Jason, T4.9 Kim). Both natural and mechanized sounds were described as more vivid, clear, and pure due to the backdrop of silence against which all park sounds are heard. Finally, the interviews revealed an overwhelming sense of Yellowstone as a guardian of natural sounds, a place specifically set aside to protect the overall environment, to which the sounds are an essential component (T4.9 Miriam, T4.9 Craig). The fragility and rareness of the natural soundscape were frequently cited as valuable reasons for Yellowstone's need for protection so that current and future generations of visitors could have the opportunity to experience such sounds. There was not a single interview in which natural sounds were not considered to be of essential value to the park overall. For every visitor interviewed, natural sounds were considered to be a unique and valuable aspect of Yellowstone National Park and the hypothetical loss of such natural sound opportunities was considered a loss of part of the essence of the park itself.

3.4.4 How do Visitors Characterize Mechanical Sounds in the Park?

While there was a range of perspectives on the existence of mechanical sounds and vehicles in the park, all but one of the interviewees supported the use of snowmobiles and snow coaches in the park with policies for best available technology, guided groups, and limited group sizes. The variations on these themes will be explained in this section as well as the perspectives from the visitors interviewed who expressed disapproval of any snowmobile use in the park. The majority of visitors interviewed held moderate views related to their desires for both motorized access and preservation of the natural soundscape. However, the level to which individuals had

actually processed the conflict inherent in these demands, that access by motorized vehicle may disrupt the natural soundscape, and the subsequent desired reconciliation between the two was less clear. Indeed, many visitors interviewed tended to be working through reconciling these conflicting demands and potential trade-offs as they moved through the interview. Ultimately, few visitors articulated a full reconciliation of these conflicting demands such as realizing that virtually any scenario with motorized access would at least somewhat compromise the natural soundscape. In other words, visitors tended to simplify the inherent tension between motorized access and natural soundscape integrity by commonly deferring to the status quo while expressing uncertainty on specific preferred management actions that affect both access and the natural soundscape. These points will be elucidated throughout this section.

All but one visitor (T4.10 Kelly) interviewed expressed an understanding and acceptance of mechanical sounds in the developed areas of the park. A distinction between front country and backcountry zones was thus applicable to the natural soundscape in the park. Visitors described how they both expect and accept the fact that there will be motorized sounds near the Old Faithful area, roads, and other developed areas within the park (T4.10 Mike, T4.10 Miriam). At the same time, visitors also described the importance of ensuring opportunities guarded from such motorized sounds, when exploring the park whether it is on foot, on skis, on snowmobile, or during snow coach touring. Almost all snowmobilers and snow coach riders expressed the importance of enjoying the natural sounds of the park when their vehicles were stopped, although they did acknowledge that while they were riding, naturals sounds were simply not a part of their experience; they accepted that some portions of their time in the park would not allow for natural soundscape experiences as part of the trade-off in choosing that mode of

transport. What was important to these visitors was that when they did turn off the vehicles or walk around near their vehicles, the natural soundscape would be there to be experienced.

Table 4-10: Interview Excerpts: Visitor Perceptions of Mechanical Sounds & Vehicles in Park

T4.10 Mike	SK-F	***[Acceptance of Mechanical Sounds in Developed Areas of Park 98%]*** "Well everyone has to get in here, and I know that when I'm near the lodge and there are more people, that I'm going to hear the sounds of vehicles or whatever. I accept that. When I'm out skiing though, especially if I'm away from the road, I expect it to be quiet, to not hear any vehicles or other noises. Then I want to be in the park, to hear it, to see it, to experience it."
T4.10 Miriam	SC-F	"Of course there are going to be the sounds of vehicles in some places in the park. You know there's going to be noise near the lodge since that's where everybody is staying and where the restaurant and shop is. That's obvious and necessary. We all need to ride in here so we can visit. No one would get to see the park at all if you had to hike in here on skis 20 miles in the winter—and you couldn't survive, so obviously we need to have vehicles and the sounds that go with them at the lodge and on the roads. Of course, no one comes here to hear the sounds of the snow coach or whatever, and I've found the park to be really quiet once you're away from the lodge."
T4.10 Kim	SK-F	***[Importance of Access Options 90%]*** "I like that you can ride a snowmobile or a snow coach, that you have the choice. It's important for people to have their options when they come here. I'm glad there are snowmobiles here, but they need to be controlled like everything else, so that the park stays nice."
T4.10 James	SK-R	"It's great that they've made changes and that now everyone has the choice to snowmobile, ski or do whatever they want while they're here. Before the snowmobiles were out of control. It was really bad because other folks, like me and my family, couldn't even ski to a trail because just being on one of the roads was so dangerous with all the crazy snowmobilers. But I want snowmobiles to be allowed in here because the park should be a place where there are options for experiencing it. I know that everyone doesn't come here to ski and that's okay. They should have a way to see the park too."
T4.10 Peter	SK-R	***[Environmental Responsibility of NPS 72%]*** "I'm so glad that the vehicles are using better technology, that they're quieter. I know we're going to have some noise from them, but to the extent that we can limit that and require better vehicles, that's so much better. I'm really happy that the park is showing leadership on that. I'd love to see vehicles with no emissions that are totally silent. I would even pay more for that. I hope the park keeps on pushing for ways to tour the park that are good for the environment."
T4.10 Sean	SC-R	"It's great that the park is requiring quieter vehicles. I wish they would keep doing that and continue to raise the standards. This is a place where we should be practicing environmental stewardship and how we interact with the environment, even during a park visit is an opportunity for the park to teach people about good

		practices and behavior. I totally support the park in taking a stand and requiring visitors to be environmentally friendly. I'd like to see even more of that."
T4.10 Lynn	SK-F	***[Integrate Access & Preservation 98%]*** "We need to have the vehicles in the park. The park is for people and that's the way we get in to appreciate it. But the park also needs to be preserved so that we can really enjoy what a special place it is when we're here. I would want the park to do something different with the vehicles if there was a negative affect on the park, on the environment. Thinking about the sounds again, it would be really annoying if you heard the vehicles all the time, but you don't."
T4.10 Brian	SM-R	"We all need to get in here and those are the machines we use to do it, so you can't stop that, but it's good that you don't hear it all the time otherwise the park would be ruined. I know that snowmobiles make noise, and the other vehicles, but you don't come to Yellowstone to hear snowmobiles."
T4.10 Alex	SK-R	"To be honest, I don't really like snowmobiles. I don't really like the sound and the smell when I'm in the park. But at the same time, I think they have a right to be here. I respect that some people want to see the park that way and they should have that opportunity. As long as there are still places where people who want to enjoy the peacefulness of the park can do that, then I don't have a problem. I had a great time here and I don't hear or them that much when I'm out.
T4.10 Doug	SC-F	***[Advocacy/Environmental Role of Access 46%]*** "I think it's really important that people have the opportunity to come here and using a vehicle is necessary for that. You have to get people in here so that they can appreciate it. People need to experience this place, so that it will continue to exist for ages to come, you know? You need to do it in a way that still keeps the park in good condition, though. I think it's good to have the guides to both control the vehicles and to teach people about the park."
T4.10 James	SK-R	"One thing I notice is that there aren't very many young people here. Most people are my age, maybe 50 and up and when I was younger I remember things being different, seeing a range of ages out there on the trails. I wish more people were out there on the trails skiing and getting out away from the lodge, but at the very least, we need to get people in here, even on snowmobiles or just doing the tours so they know how important and special it is. If people don't come to the park, they'll never know and then where will the park be in 50 or 100 years? It's absolutely essential and that's another reason we have to have motorized access, but controlled, here in the park."
T4.10 Janet	SM-R-L	***[Unreconciled Access & Preservation 52%]*** "The main reason I come to the park in the winter is because it's quiet, calm, and there aren't many people…The whole snowmobile thing is ridiculous. They should allow more snowmobiles and groom more roads for them. There's no problem. The snowmobiles are fine; it's the park that has the problem…The snowmobiles belong in the park and we should be able to use it, but they have to be controlled. Yeah, they have to be guided. They need to be controlled. That's the only way. You can't let them in without a guide. People don't follow rules. And because they need to be babysat, they need to have a limit on the number of people who go with a guide; otherwise, people will trail off and

		start doing their own thing. So they have to be controlled, definitely."
T4.10 Liam	SM-R	***[Natural Sounds Not As Important as Access 2%]*** "Getting in here to see the park is more important than worrying about the sounds from the snowmobiles and snow coaches. This park is our park and we need to be able to get in here, otherwise why do we even have it, you know? So I don't like the idea that someone would be turned away. I don't even know if that happens, but I hope not. I didn't have a problem reserving a sled. But, to the extent that we can use 4-strokes, with better technology, that's a good thing and having the snowmobiles guided is a must too. So as long as you have them guided and using the 4-strokes, then it's fine. In fact, I'd like to see more snowmobiles in here, especially if they were the quiet ones."
T4.10 Susan	SC-F	"You know, the motorized sounds don't bother me. I guess I just don't listen that much to that kind of stuff. My personal feeling is if you're going to take the snowmobiles and everything else away from the park, then you should take it all away, and everybody should snowshoe in or something. You know, nothing motorized."
T4.10 Kelly	SC-F	***[Disapprove of All Snowmobile Access 2%]*** "Snowmobiles are not a recreational activity. They're not here to really be in the park. The activity is more about being on a snowmobile than being in the park. I think they're totally unacceptable. It's not what the park is for. They're zipping around. They disturb me and what I'm doing in the park. Trying to take a photo and then all these snowmobiles whiz by; it totally takes you out of the moment. They should be banned."
T4.10 Sean	SC-R	***[Approve of Guided Access Because of Affect on Natural Soundscape 22%]*** "It's important that [the snowmobiles] are in groups because then you don't hear the noise from them all the time. They're not all over the place all of the time. There are plenty of chances to hear the quiet, to hear the animals, to just listen and be still. The guided groups really help to make that possible."
T4.10 James	SK-R	"One thing I notice is how now that snowmobiles are guided in groups, you don't hear them all the time. A group will pass by and then it's quiet again for a while. It's so much better now. I understand that snowmobilers want to be here too, but it's nice that the park figured out a way, with the guides, to respect people who aren't here to snowmobile. You can hear the sounds of the park now before and after the groups pass you. Before, it was like a racetrack all the time. It was ridiculous. This is not Disneyland. It's a National Park and it should look and sound like one. Things are good now, though."
T4.10 Talia	SC-F	***[Enjoy the Sound of Snowmobiles 2%]*** "I like to hear the snowmobiles. They roar through and contrast with the quiet when you're out there, and then they disappear and it's so quiet again. It's great. It would be very annoying if you heard them all the time, but to hear them sometimes really provides a stark contrast to the naturalness of the park. It's like hearing the urban human world against the backdrop of the quiet wilderness. It's impressive. If you heard it all the time, though, it wouldn't be right. That's not what you should hear in a park."
		[Snowmobiling as Direct Experience 4%] "I like to snowmobile more than ride the snow coach because I can really get out there in the park, be away from everything,

T4.10 Vincent	SM-R	and be right there out there in the park. The wind on my face, the ice under my feet, the animals all around. I feel like I can really experience the park that way, better than in an enclosed snow coach, where I feel confined like I'm in a pod watching the park go by. I don't like the snow coaches; you have to be with all these other people; you can't really be in the park except when you're out of the snow coach. It's too confining. I came to the park to really be out there, feel it, see it, hear it. You know. On a snowmobile, I can do that."

Some respondents were particularly supportive of multiple transport options in the park, supporting both snowmobile and snow coach access. They indicated that having options and the freedom to choose your mode of transport and primary activity in the park was a valuable part of the park experience (T4.10 Kim, T4.10 James). Some visitors described and supported the environmental leadership role of the park and how that manifests itself with the regulations for best available technology, guides, and group tours. Many interviewees described their support for and belief in the importance of the park taking leadership on providing and requiring the most environmentally friendly transportation options (T4.10 Peter, T4.10 Sean). For example, one visitor (T4.10 Peter) specifically mentioned their willingness to pay greater entry or transportation fees in support of quieter, less polluting vehicles for both snow coaches and snowmobiles. Visitors who expressed these views on environmental responsibility frequently described their hope for the park to continue to require environmentally friendly vehicles and continually improve the technology required for entry. While the patterns again were not highly distinct, skiers were most likely to talk about environmental responsibility; snow coach riders followed; and finally snowmobilers were the least likely to express comments on the environmental leadership element of the park policy. These are shades of difference in responses, not clear cut distinctions that strongly characterize differences among primary activity groups.

All but one visitor interviewed expressed moderate views on motorized sounds and vehicles used within the park. Specifically, most respondents described a very practical need to integrate motorized access options with the preservation of natural sound opportunities (T4.10 Lynn, T4.10 Brian). Several visitors, while making their way through the tension inherent between access and natural soundscape integrity, emphasized the educational and advocacy role that the park must fulfill by providing motorized access to the park in winter (T4.10 Doug, T4.10 James). These visitors were quick to express the value that comes from visiting the park, the educational role that the park can play in an individual's life, and therefore, the responsibility that the park has for providing opportunities to experience the park during the winter. These respondents tend to be tapping into the relationship between park experience or appreciation and the development of a political constituency for the park.

During the course of several interviews, it became evident that many respondents had unreconciled and unexplored views about the desire for both access and preservation (T4.10 Janet) that they began to work through during the interview. This, in part, reflects little prior time addressing the inherent complexities of the management question. While the park represents freedom and wilderness on one hand, and those are deeply valued and frequent drivers of visitation to the park, on the other hand, motorized access does infringe on the natural character of the park. For a few, frequently local visitors and in all cases repeat visitors to the park, knowledge of the historical changes in winter park regulations had left an impression, frequently oversimplified in the beginning of the interview where visitors would argue vehemently for the freedom to access the park on whatever vehicle they choose without any restrictions, particularly on snowmobiles. However, as respondents moved through the interview, and perhaps came to trust that the interviewer's purpose was not to build an argument

against snowmobiles, but to understand how visitors would like to see these conflicting demands negotiated, the respondents tended to feel more comfortable with the notion of access restrictions, at least those currently in effect in the park. As the interview progressed, those who had started their conversation with the interviewer arguing for more motorized access, began to also articulate their support for restrictions like guides and group size limits. The sensitivity of winter access for some was apparent in only one of the interviews (T4.10 Janet); however, of particular significance was this respondent's desire for the park to protect the natural soundscape as management simultaneously allowed the greatest level of access possible. Even for someone with a general distaste for regulations on visitor access of public lands, the tension between access and soundscape preservation was quite salient and like the more moderate majority of respondents, most visitors had not fully worked out just how these two demands should be reconciled, for themselves or for park management.

There was a tendency to oversimplify the management question, characterizing it in terms of one demand or value for the park: access and all that may represent (freedom, advocacy, inspiration, etc.) or preservation of the integrity of the park. Once respondents moved through their thoughts on the necessary trade-offs inherent in access and preservation, in all but one case, they tended to come around to some idea of balance or integration. The specifics of how those two should be balanced, however, were frequently unclear. All but one visitor indicated their general support for the current regulations, approving of total vehicle entry limits, group size limits, best available technology requirements, and guides. However, the very fact that many visitors could not fully articulate just what specific management actions they would like to see, or at what point access would begin to infringe too much on the natural soundscape validates the idea that this question is both complex and very fuzzy, that these are in fact social

judgments that to some extent can be monitored, tested, and evaluated, but that require deliberative discourse to elucidate the full complexity of the management challenge relative to decision-making and building or maintaining relationships with visitors.

While most visitors described a practical need to integrate access and preserve the integrity of the natural soundscape without having to give up either one, one visitor expressed the view that access was more important to them than preserving the natural soundscape (T4.10 Liam). Yet even this person, specifically mentioned their support of the park requiring best available technology and doing what was possible to protect the soundscape while also providing access. For this visitor the idea of access limits in terms of the number of visitors allowed in the park was unacceptable, but other types of restrictions such as group size, guides, and best available technology are desired (T4.10 Liam). Among the few individuals who felt that access was more important than preservation of natural sounds, one notable characteristic was that they fundamentally shared the same views about the management of natural soundscapes as the majority of visitors interviewed. Overall, all visitors interviewed want both access and preservation; they expect the park to show leadership in designing options that are environmentally friendly so that visitors can enjoy a high quality park experience. The specifics of what individuals may be willing to trade off may vary, but overall the desire to maintain access and environmental integrity were both strong.

While some respondents viewed the motorized vehicles of snow coaches and snowmobiles as acceptable and welcome in the park under regulated use, a small (within this sample) contingent exists that is entirely opposed to snowmobile use in the park. One interviewee considered snowmobiling a recreational activity in itself, inconsistent with what they saw as the purpose of the park, which is to experience a natural setting without disruption from

snowmobiles (T4.10 Kelly). This visitor would prefer to see snowmobiles banned from the park and motorized access allowed exclusively via snow coach, a mode of transport which they deemed a less intrusive access option. One person interviewed, who supported regulated snowmobile and snow coach access, expressed concern about the inequity of such a position, stating that if the park were to ban snowmobiles, then they should ban all motorized access (T4.10 Susan). This position indicated a desire for a clear and equitable logic for restricting motorized access, and that the type of vehicle would not be sufficient criteria for excluding a set of vehicles from the park. This was not the desired position of the respondent, who supported motorized access to the park, but rather it provided a window into the desire for equitable applications of park regulation as they pertain to motorized vehicles. These two responses, desire to ban snowmobiles and concern over a policy of inequity that would ban snowmobiles, were only expressed by these two individuals mentioned above and do not reflect the overall direction of the research findings.

With respect to the specific relationship that motorized vehicles and the current regulations have on the natural soundscape, a few respondents described the benefits and thus their approval for the group size limit and guiding regulations. In these cases, visitors were supportive of guided group requirements specifically because they provided windows of quiet or opportunities to experience natural sounds during a visit to the park (T4.10 Sean, T4.10 James). While snowmobile groups do move through, they move through as one unit, leaving opportunities to experience natural sounds behind them. Natural sound integrity and listening opportunities were provided by the acoustical spaces between the passing guided groups. While these pulses of motorized sounds were not desirable, they were acceptable and rationalized so as to provide the opportunity to access and appreciate the park.

There was also one description of enjoying the sounds of snowmobiles, particularly as they contrasted with the natural soundscape and provided an opportunity to experience a rush related to the powerful sounds of motorized vehicles in the park (T4.10 Talia). This visitor was quick to explain, however, that hearing motorized sounds all of the time in the park would be detrimental to their experience. Some motorized sounds, from this perspective, are acceptable and even enjoyable in the park, their contrast providing an opportunity to reflect on the urban/wilderness interface. Nonetheless, even for this visitor, if the opportunities to experience the natural soundscape were eliminated or substantially degraded, their experience of the park would not be as positive and would impact the overall value of the park itself. The purpose of the park as a haven of the natural environment included the natural soundscape. Expressing enjoyment in hearing the sounds of over snow vehicles was only documented in this individual case and does not represent a pattern of responses found in the data. In fact, in this interview, it is the only time the perspective arose. The vast majority of visitors saw motorized sounds as necessary, if not entirely desirable in the park, because they provide an important means for people to experience the park during the winter season.

While the interviews document a range of perspectives related to the mechanical sounds and vehicles used within the park, it is notable that for most visitors interviewed, a keen understanding of the need to integrate motorized access and protect the natural soundscape pervaded. Time and time again during the interviews, respondents would refer to the purpose of the park as a place to experience a unique natural environment and associate natural sounds as a part of that environment. Visitors generally believed the park should protect the natural soundscape to the greatest extent possible, without sacrificing opportunities to experience it. Overall, visitors supported the current park regulations and if anything, would like to see the

park taking on greater environmental leadership by requiring better technology for motorized access that continues to be guided. A couple of visitors interviewed were clear on their perspectives that they did not support snowmobiles as a legitimate means of transportation in the park and saw this mode of transportation in direct conflict to the value of the park. These visitors did, however, support snowcoach access. This view of snowmobiles as inherently oppositional to park values and an experience of the natural character of the park was quite interestingly contrasted to a perspective on snowmobiling from those who engaged in it at the park. For some who participated in it, snowmobiling was a means of having a direct experience of the park, while riding in a snow coach was described as a mediated, confining experience where the park was less accessible from an experiential standpoint (T4.10 Vincent). The freedom of being on a snowmobile in contact with the elements was described as a more authentic, direct, and full experience of nature in the park.

3.5 Summary – Perception and Importance of Natural Sound in the Yellowstone Winter Setting.

The survey results suggest that winter visitors to Old Faithful agree that Yellowstone is a place for natural quiet, to hear natural sounds and a quiet place. There is less agreement that Yellowstone is a place free of motorized noise. The opportunity to experience natural sounds is perceived to be important to both the value of Yellowstone and the visitors experience. While there are some variations in the importance of sound when activity type is considered, those differences are largely within how much positive support there is for Yellowstone as a place for natural quiet and to hear natural sounds. Visitors who participated in snowmobiling or snow

coach touring were somewhat less likely to agree that the Yellowstone is a "place free of motorized noise."

Eighty-one percent of the respondents indicated that the natural sounds had a positive effect on their experience. Satisfaction with the natural sounds within their trip remained high and seventy-one percent of the visitors suggested they experienced the level of natural sound they desired for half or more of the time they desired it. Eighty-seven percent of the respondents were "very satisfied" with their overall experience and the remaining thirteen percent were "satisfied."

Respondents were asked about their support for a variety of management actions "to protect opportunities to experience natural sounds." Requiring best available technology, continuing to require guides, limiting the total number of snow machines in the park per day and limiting group sizes to 11 per guide were strongly supported by a minimum of sixty-eight percent of the respondents. Closing the roads to all over snow vehicles or to snowmobiles only was opposed or strongly opposed by a majority of the respondents. Plowing the roads for automobile access was strongly opposed by seventy-one percent of the respondents and opposed by another nine percent.

In-depth interviews illustrate that the natural soundscape assists in providing a deep connection to nature that is restorative and even spiritual for some visitors. Natural sounds influenced respondent's motivation to visit Yellowstone and were an unexpected yet significant part of the experience for interviewees. All interviewees indicated that the natural sounds are part of what makes the park special. While interviewees dominantly accept mechanical sounds

in the park, especially near developed areas, they generally wanted some time in their experience to be quiet and natural.

4 VISITORS' PERCEPTIONS OF BISON ENCOUNTERS IN THE YELLOWSTONE WINTER SETTING

The third study objective explored how YNP winter visitors appraise human-bison interactions they observe during their visit. The primary goals of this aspect of the research were: (1) to explore snowcoach, snowmobile, and cross country skiing winter use visitors' affective and normative appraisals of the human-bison interactions they witness during their visits and (2) to analyze situational and visitor characteristics that might influence those appraisals.

4.1 Selection of Survey Respondents and Survey Analysis.

The questionnaire and sample of visitors used to address this study objective were different from the questionnaire/sample used to address winter visitors' of the YNP soundscape, though the sampling procedure was similar. Visitors were approached in three locations within the Old Faithful area (inside the Snow Lodge, outside near Old Faithful Geyser, and both inside and outside the warming huts near Old Faithful Geyser) in Yellowstone National Park during the 2007-2008 winter use season. The potential respondent universe for the survey was all visitors, eighteen years of age or older, stopping at Snow Lodge and Old Faithful from 1/02/08 to 3/09/08. Surveys were conducted on twenty days spread across the winter season, eleven of which were weekdays and nine of which were weekend days. Sample periods were selected to ensure a balance of weekend and weekday periods and a distribution across the winter season. Given the use patterns at Old Faithful, visitors were contacted between 10:00 AM and 3:00 PM.

Visitor selection occurred based upon a pre-designed systematic schedule starting with the first available group during the sample time. Within groups, the sampled adults (eighteen years of age and older) were chosen using the next birthday method. Once the surveyors finished with one group, they moved on to the next eligible group that arrived at the survey site. If a group declined to participate in the study, the research assistant then contacted the next eligible group. Four hundred forty-three visitors were approached to complete a survey; 411 (93%) agreed to participate in the survey.

The bison questionnaire survey is included in Appendix B. Because of the complexity of survey questions 7-8, which explored the nature of bison human interactions visitors observed, the survey was administered in two phases. In the first phase (Questions 1-8) a research assistant actually asked the questions of visitors in an interview schedule format. This way the research assistant was able clarify any potential confusion over questions 7-8. For the second phase (questions 9-20), the remainder of the questionnaire was handed to the respondent who answered to the remaining questions independently.

4.2 Who were the Visitors Sampled?

Four hundred eleven visitors to Yellowstone National Park responded to the visitor perceptions of bison survey. Respondents ranged in age from 18 to 77 years old with an average age of 47 years (see survey with summary data reported in Appendix B). Just over half of the respondents (52%) were male and 48% percent were female. Visitors participating in the survey came primarily in family groups (75%), another 32% visited with friends, 6% as part of an organization or club, and only 3% alone. Survey respondents spent anywhere from 1 to 14 days in the park with 40% spending one day, 12% spending two days, and 18 % spending three days.

Snowmobiling was the most commonly listed primary activity in the park (39%), followed by snowcoach touring (29%), cross country skiing (16%), and snowshoeing (6%). Visitors' places of residence were quite diverse; respondents came from 42 different U.S. states and 11 foreign countries. Montana contributed the largest percentage of visitors (16%) followed by Utah (8%), Idaho (6%), and Georgia (6%). International visitors comprised 5% of the sample. Table 5-1 shows states contributing 2% or more of sample respondents. Summary statistics describing other visitor characteristics including highest level of education and size of community visitors came from are included in Appendix B.

Table 5-1: Place of residence of visitors' in the 2008 Yellowstone National Park winter visitor perceptions of bison survey (shows only places contributing 2% or more of sample).

Origin	N	%
MT	60	15.6
UT	29	7.6
ID	21	5.5
GA	21	5.5
CO	20	5.2
WY	18	4.7
TX	18	4.7
FL	13	3.4
VA	13	3.4
NY	11	2.9
OH	11	2.9
WA	11	2.9
PA	10	2.4
CA	9	2.3
SC	9	2.3
Foreign	18	4.7
Total	292	76.0

4.3 What types of interactions between bison and humans did the visitors observe?

Ninety-nine percent of the visitors in the sample had observed bison by the time they reached Old Faithful and the vast majority (88%) had multiple encounters, with a median of 6 encounters per visitor (see survey with summary data reported in Appendix B). Table 5-2 shows visitors' characterizations of bison response to human presence during the encounter. As noted above, the vast majority of visitors encountered bison on multiple occasions, so it was possible for visitors to note more than one kind of bison response to encounters with winter visitors. The first and second data columns in Table 5-2 shows the visitor responses to the actual survey question and indicates that 99% of the visitors had encounters where they believed the bison did not seem to notice the presence of humans or over-snow vehicles, 82% saw encounters where bison appeared to notice the humans but resumed their activities, while 16% saw interactions where they thought bison were hurried, 11% saw interactions where bison were put to flight, and less than 2% of visitors saw a defensive charge. The third and fourth data columns in Table 5-2 use the same survey questions to group visitors according to the most "intense" bison response to humans they witnessed. Forty-three percent of the respondents indicated observing only interactions where the bison either did not respond or merely looked up before resuming their activity. Another 36% of respondents observed encounters where the bison were alarmed/vigilant, moved away but in an unhurried manner, or appeared blocked in their desired movement. Finally 21% of respondents observed more significant responses from bison (including hurried movement, flight, defensive charge, etc.).

When responding to questions about specific encounters (questions 9-13), visitors were asked to select and describe the encounter with the most significant or "intense" response they saw from bison. The second data column in Table 5-2 puts visitors in groups according to the

most significant or "intense" bison response they described witnessing. This way of grouping visitors is used in the chi-square analyses presented in section 5.5 of the report to explore whether there was a relationship between the nature of the interactions observed and visitors' appraisals of those interactions. Forty-three percent of the visitors sampled who observed bison described witnessing bison responses no more intense than noticing the presence of humans and resuming their activity. Another 36% of visitors witnessed interactions where bison appeared to be vigilant; to move away in an unhurried manner; or to have their desired movement blocked. Finally, the remaining 21% of visitors indicated witnessing interactions where bison were hurried, put to flight, defensive toward humans, or appeared to fight each other as a result of human presence.

Table 5-2: Visitor characterization of the nature of bison responses to the presence of humans they witnessed, 2008 Yellowstone National Park winter visitor perceptions of bison survey.

Bison Responses	Visitors Observing Bison Response		Most Intense Bison Response Observed by Visitors	
	N[1]	%[2]	N[3]	%[3]
None, the bison did not seem to notice the humans/over-snow vehicles	402	99.0	176	43.3
The bison appeared to look up or notice, but resumed their activity	332	81.8		
The bison appeared alarmed and vigilant	74	18.2	144	35.5
The bison traveled apparently to get farther away from the humans/over-snow vehicles, but appeared unhurried	191	47.0		
It appeared that the bison's desired movement was blocked	8	2.0		
It appeared that the bison's movement was hurried by the encounter	64	15.8	86	21.2
It appeared that the humans put the bison to flight (at some point the bison ran)	45	11.1		
It appeared that the bison were defensive and charged or seemed ready to charge humans/vehicles	6	1.5		
Other: (human presence appeared to cause bison to fight each other)	3	0.7		

[1]Number of visitors who indicated they observed this response (total N=406).
[2]Percent of visitors who indicated they observed this response.
[3]Number or percent of visitors in this grouping.

When describing their encounter in which bison showed the most significant or intense response, over three-quarters of the visitors (77%) indicated that at least some of the bison were on the road (see survey with percentages reported in Appendix B). Half the respondents indicated that most of the bison in their "most intense" response encounter were walking while another 38% of respondents described the bison as feeding (see survey with percentages reported in Appendix B). In response to these bison encounters, respondents most commonly indicated that visitors remained on or near their over-snow vehicles (Table 5-3) – only 5% of the respondents described witnessing an encounter where visitors sought to approach the bison. Nineteen percent of the visitors described witnessing encounters where over-snow vehicles weaved through/around bison on the road to get past them.

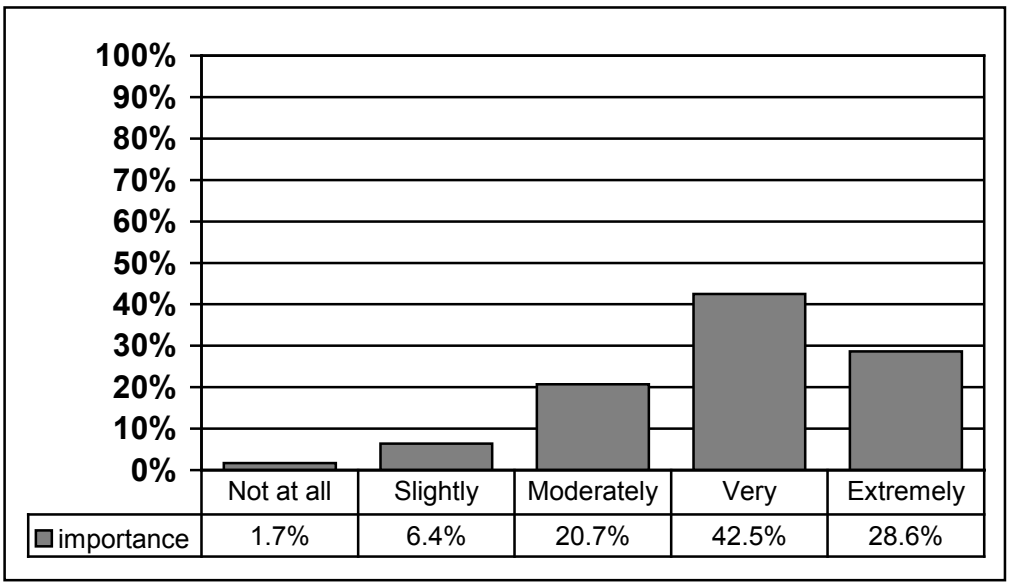
Table 5-3: Visitor characterization of the nature of human responses to bison they witnessed, 2008 Yellowstone National Park winter visitor perceptions of bison survey.

Human Responses in relation to bison	Visitors Observing Human Response	
	N[1]	%[2]
Stopped, but remained on/in snowmobile/snowcoach	289	71.2
Dismounted snowmobile/exited snowcoach, but remained near vehicle	101	24.9
Approached bison to get a better look or better picture	22	5.4
Snowmobile/snowcoaches weaved through/around bison on road to get past them	78	19.2
A snowmobile/snowcoach hit a bison	1	0.2
Other	32	7.9

[1]Number of visitors who indicated they observed this response (total N=406).
[2]Percent of visitors who indicated they observed this response.

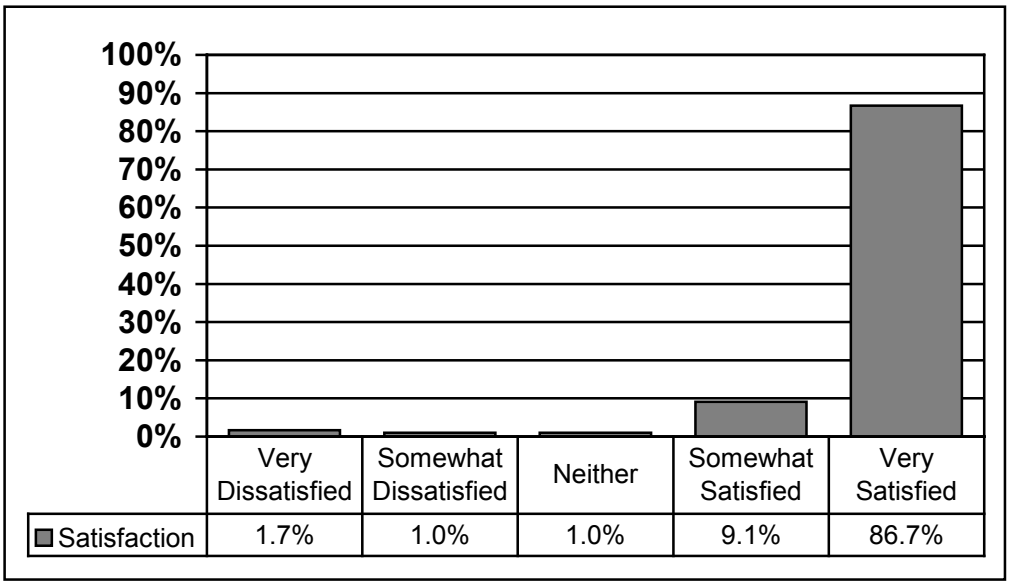
4.3.1 Overall importance of and satisfaction with opportunity to view bison

The vast majority of respondents who observed bison indicated that the opportunity to view bison is an important part of their experience in Yellowstone (71% indicated it was "very" or "extremely" important) (Figure 5-1). Further, respondents who observed bison overwhelmingly indicated a high degree of satisfaction with the opportunity to view bison they experienced during their visit (87% indicated very satisfied and only 3% indicated they were dissatisfied) (Figure 5-2).



N = 405

FIGURE 5-1. VISITOR RATING OF IMPORTANCE OF OPPORTUNITY TO VIEW BISON TO THEIR OVERALL YNP EXPERIENCE



N = 406

FIGURE 5-2. VISITOR RATINGS OF SATISFACTION WITH OPPORTUNITIES TO VIEW BISON

4.4 How do visitors appraise those interactions in both affective and normative senses?

The National Park Service's mission with respect to bison management includes a stewardship role. Originally the notion of stewardship focused primarily on conserving wildlife populations and maintaining their capacity to produce future generations. However, societal changes associated with urbanization, trends toward a greater focus on the cultural and symbolic meanings of wildlife, increased public concern for the treatment of animals, and an expanding segment of society interested in including animals in the moral community (Kearns, 2001; Montag, Patterson and Freimund, 2005; Sutherland and Nash, 1994) have led to a broadening in perspective on the agency's stewardship role among a portion of the public. In addition to species and population conservation, a growing number of visitors now also associate the agency's stewardship role with protection of the welfare and well-being of individual animals and with the protection/proper management of the cultural and symbolic values these animals represent to American society. The types of visitor perceptions assessed in the bison study

included a focus on visitor appraisals related to this broader definition of the stewardship function.

Past research on visitor appraisals associated with wildlife viewing experiences fall broadly into two classes: affective appraisals and normative appraisals. Affective appraisals refer to judgments or evaluations visitors attribute to a place, object, or event based on experiences (Russell and Snodgrass, 1987). According to Russell and Snodgrass, these appraisals are viewed as a quality of the place, object, or event being appraised, which distinguish them from other emotional events such as moods or emotional dispositions. An example of an affective appraisal explored in the survey is the extent to which visitors felt the bison they observed appeared healthy versus unhealthy. Normative appraisals refer to prescriptive judgments about the acceptability of situations encountered. An example of a normative appraisal explored in the survey was the extent to which visitors thought the bison encounters they described witnessing were appropriate versus inappropriate.

4.4.1 Affective Appraisals of Specific Encounters

Visitors were asked to respond to several semantic differential-type items which reflected "affective appraisals" of bison in relation to one bison viewing experience. (A semantic differential item is a common question format in survey research in which pairs of opposite adjectives like appropriate/inappropriate are presented and the respondent indicates which most closely matches their appraisal of a situation, for example, see question 13 of the Bison Survey in Appendix B). These affective appraisals represent visitor perceptions about the well-being and condition or state of the bison observed during the viewing experience (e.g., healthy/unhealthy, agitated/calm, etc.). In terms of choosing a particular viewing event on which to base their

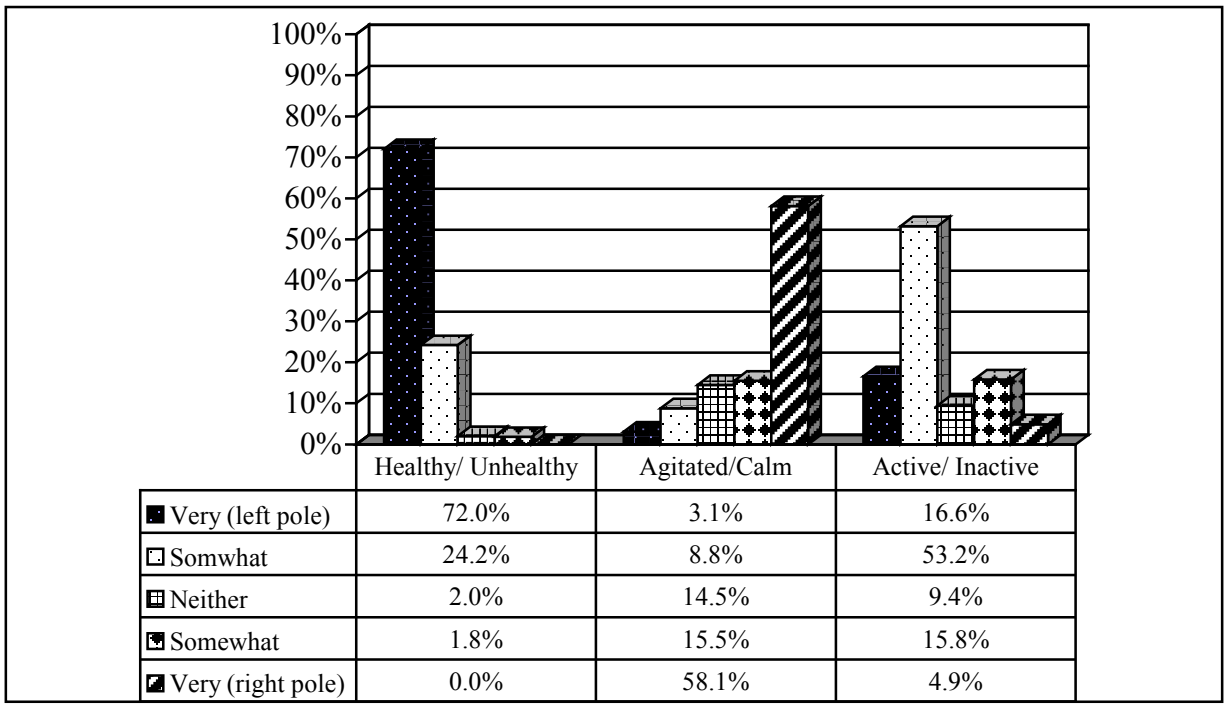
responses, visitors were asked to base their appraisals on the viewing experience for which bison showed the most significant (intense) response (e.g., alarm, movement blocked, flight, etc.) to the presence of humans. This approach was taken to ensure that visitors were focusing on evaluating the "worst case" situations that they witnessed in terms of bison-human interactions. Visitors who indicated they had only observed interactions in which bison either did not seem to notice the presence of humans or merely looked up before resuming their activity were asked to respond in relation to the bison viewing opportunity that had the greatest effect on their experience.

The first affective appraisal explored related to bison health. The vast majority (72%) of visitors believed the bison appeared "very" healthy and none thought they appeared "very" unhealthy (Figure 5-3). The second affective appraisal explored the degree to which visitors felt bison were agitated versus calm. The majority (58%) thought the bison were very calm, but there was somewhat more dispersion across the (agitated/calm) scale compared to the healthy/unhealthy appraisal (Figure 5-3). Even so, less than 12% of the visitors indicated that bison appeared to be agitated. Finally, most visitors (53%) characterized bison as somewhat active during the interaction.

4.4.2 Normative Appraisals of Specific Encounters

Normative appraisals (evaluations that deal with judgments about the acceptability of the interactions observed rather than the perceived condition or state of the bison) were also evaluated in relation to the most significant bison response to humans event visitors witnessed. The same semantic differential response format described above was utilized in the normative appraisals. Four normative judgments about the bison-human interaction witnessed were

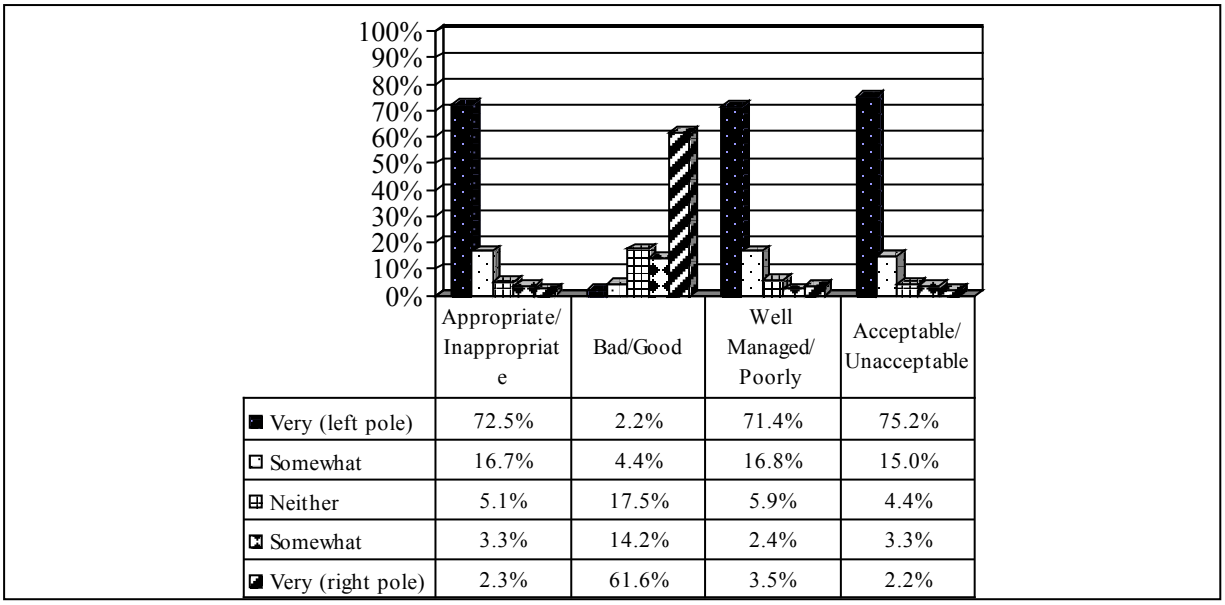
examined (appropriate/inappropriate, bad/good, well managed/poorly managed, and acceptable/unacceptable). In the case of appropriateness, quality of management, and acceptability, over 70% of the visitors held the most positive possible endorsement (Figure 5-4). In contrast, the proportion indicating that the interaction was "very" good was slightly lower (62%). However, in the case of all four normative appraisals, less than 7% of the visitors selected either of the responses on the negative appraisal end (i.e., "very" or "somewhat") of the semantic differential pole.



	Healthy/ Unhealthy	Agitated/Calm	Active/ Inactive
Very (left pole)	72.0%	3.1%	16.6%
Somwhat	24.2%	8.8%	53.2%
Neither	2.0%	14.5%	9.4%
Somewhat	1.8%	15.5%	15.8%
Very (right pole)	0.0%	58.1%	4.9%

N = 396, 387, 385 respectively

FIGURE 5-3. VISITORS' AFFECTIVE APPRAISALS OF BISON FOR THE MOST SIGNIFICANT RESPONSE OF BISON TO HUMANS EVENT THEY OBSERVED



	Appropriate/ Inappropriate	Bad/Good	Well Managed/ Poorly	Acceptable/ Unacceptable
Very (left pole)	72.5%	2.2%	71.4%	75.2%
Somewhat	16.7%	4.4%	16.8%	15.0%
Neither	5.1%	17.5%	5.9%	4.4%
Somewhat	3.3%	14.2%	2.4%	3.3%
Very (right pole)	2.3%	61.6%	3.5%	2.2%

N = 389, 365, 374, and 376 respectively

FIGURE 5-4. VISITORS' NORMATIVE APPRAISALS OF THE MOST SIGNIFICANT RESPONSE OF BISON TO HUMANS EVENT THEY OBSERVED

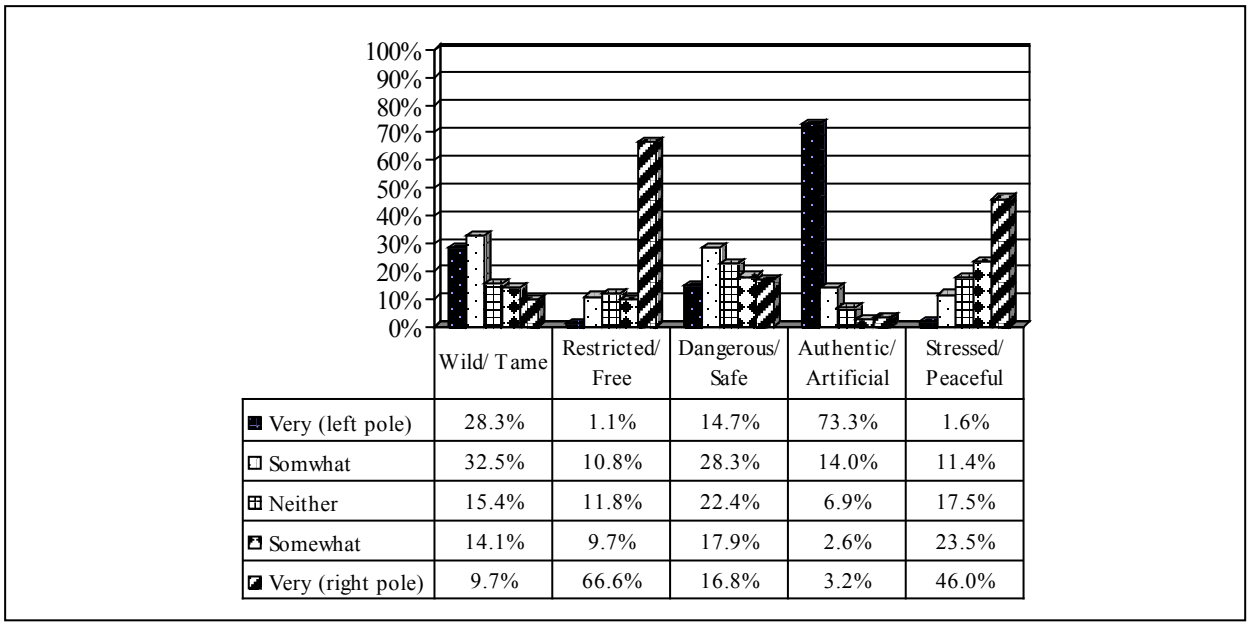
4.4.3 Overall Appraisals of Yellowstone Bison and Winter Setting

Due to the possibility that visitors might be concerned about the event involving the most significant/intense bison response to humans they witnessed but not about the overall set of bison human interactions they experienced during their visit, visitors also were asked for affective appraisals in relation to their overall bison viewing experience and for normative appraisals of the overall winter use setting in Yellowstone National Park. Overall, more than two-thirds of the visitors held the impression that the bison were "very" free and "very" authentic (as opposed to restricted and artificial) (Figure 5-5). At the same time, a much smaller percentage of visitors (28%) described the bison as "very" wild and nearly a quarter of the visitors felt the bison were "somewhat" to "very" tame (Figure 5-5). These results suggest the possibility that most visitors believe bison are somewhat habituated to human presence, losing some of their perceived

wildness, but that Yellowstone bison still lead a largely free and unrestricted life and remain an authentic symbol of our western heritage. The lower percentage of respondents rating bison as "very" wild (compared to the percentage rating bison as "very" free) in conjunction with the frequent lack of response of bison to human presence may be related to the perceptions of bison as dangerous versus safe observed in the survey. Only 15% of the visitors described bison as "very" dangerous while slightly more than a third found bison "somewhat" to "very" safe (Figure 5-5).

The overall appraisal of bison in YNP included a measure that closely parallels the "agitated/calm" appraisal examined for the specific interaction analysis described above (in section 5.4.2). While 58% of the respondents characterized the bison in the "most intense" encounter as "very calm" (Figure 5-3), less than half the visitors (46%) described the Yellowstone bison as "very" peaceful overall (Figure 5-5). However, only 13% of respondents described the bison overall as "very" or "somewhat" stressed (Figure 5-5).

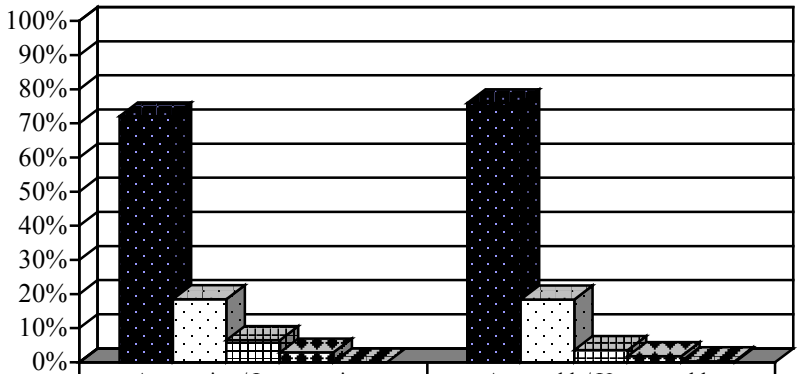
Finally, with respect to the "normative" appraisals about the overall winter setting, visitors provide the park a strong positive endorsement. Approximately three-quarters of the visitors indicated it was "very" appropriate and "very" acceptable and less than 3% indicated the setting was either "very" or "somewhat" inappropriate/unacceptable (Figure 5-6).



	Wild/ Tame	Restricted/ Free	Dangerous/ Safe	Authentic/ Artificial	Stressed/ Peaceful
Very (left pole)	28.3%	1.1%	14.7%	73.3%	1.6%
Somwhat	32.5%	10.8%	28.3%	14.0%	11.4%
Neither	15.4%	11.8%	22.4%	6.9%	17.5%
Somewhat	14.1%	9.7%	17.9%	2.6%	23.5%
Very (right pole)	9.7%	66.6%	16.8%	3.2%	46.0%

(N=382, 380, 375, 378, 378 respectively)

FIGURE 5-5. VISITORS' AFFECTIVE APPRAISALS OF BISON OVERALL



	Appropriate/ Inappropriate	Acceptable/ Unacceptable
Very (left pole)	72.1%	75.9%
Somwhat	18.5%	18.4%
Neither	6.5%	3.6%
Somewhat	2.9%	1.8%
Very (right pole)	0.0%	0.3%

(N=384, 386 respectively)

FIGURE 5-6. VISITORS' NORMATIVE APPRAISALS OF OVERALL WINTER SETTING

4.5 Is There a Relationship Between Visitor Appraisals and the Nature of Interaction Observed?

Although the visitors' appraisals were consistently positive by a wide margin, a follow up analysis was conducted to determine if there was a relationship between affective and normative appraisals and the nature of the bison human interactions the visitor witnessed. Data for these analyses are presented as "cross-tabulations" in which responses to appraisal questions (columns) are compared across visitor groups defined according to different types of interactions (rows). Visitors were assigned to groups according to the most significant bison human interaction they witnessed (see Table 5-2 presented above). Chi-square analyses were conducted to determine if there were statistically significant differences among these groupings with respect to their normative and affective appraisals. If there were, standardized residuals were analyzed to determine more specifically the nature of those differences.

Table 5-4 explores the affective appraisals of the most significant human bison interaction a visitor observed. Statistically significant differences ($p < 0.05$) were found for the "agitated/calm" appraisal. This indicates that there was a relationship between the nature of encounter observed and visitors' appraisals of bison on this characteristic. As might be anticipated, visitors who responded to an incident in which the bison were "hurried/put to flight/charged humans/vehicles" (in other words, visitors who witnessed the most significant bison responses to humans) were far less likely than expected[1] to say the bison were "very" calm and were more likely than expected to say bison were "very" to "somewhat" agitated (see also

[1] Note that "the expectations" referred to here and in other chi-square analyses refer to the results expected if the null hypothesis (that there is no difference across the grouping variable) being tested in chi-square analysis were true. Large discrepancies between an expected value and an observed value result in a large standardized residual and provides evidence of the nature of the relationship between the two variables being examined.

Figure 5-7). However, there was no statistically significant ($p < 0.05$) difference in perceptions about the bison health or degree of activity across visitors describing different types of interactions. In other words, there appeared to be no relationship between the nature of bison responses observed and these latter two affective appraisals.

Table 5-4: Relationship between nature of the bison response to humans witnessed and visitors' affective appraisals for the most significant human bison interaction the visitors observed

	N	Very %	Somewhat %	Neither %	Somewhat %	Very %	P-value[1]
Health/Unhealthy							
Overall	396	72.0	24.2	2.0	1.8	0.0	0.372[2]
None-Brief Notice	169	74.6	20.7	1.8	3.0	0.0	
Alarmed-unhurried move	143	73.4	23.8	2.1	0.7	0.0	
Hurried-flight-charge	84	64.3	32.1	2.4	1.2	0.0	
Agitated/Calm							
Overall	387	3.1	8.8	14.5	15.5	58.1	0.000
None-Brief Notice	163	0.6-[3]	1.8-	11.7	12.3	73.6+	
Alarmed-unhurried move	141	2.8	5.0	18.4	17.7	56.0	
Hurried-flight-charge	83	8.4+	28.9+	13.3	18.1	31.3-	
Active/Inactive							
Overall	385	16.6	53.2	9.4	15.8	4.9	0.127
None-Brief Notice	161	15.5	54.7	11.2	11.8	6.8	
Alarmed-unhurried move	140	13.6	57.1	6.4	18.6	4.3	
Hurried-flight-charge	84	23.8	44.0	10.7	19.0	2.4	

[1]P-value is based on a Chi-square analysis comparing visitors according to the most intense interaction they witnessed (based on responses to question 7 on the survey). A nonsignificant p-value ($p > 0.05$) indicates affective appraisal of bison was independent of the significance of the bison response witnessed.
[2]>20% of the cells have expected value less than 5.
[3]Analysis of standardized residuals suggest that shaded cells are the largest contributors to the chi-square statistic, indicating that the value in this cell is significantly different than expected if there were no differences across groups. The +/- indicates whether the observed difference is significantly higher or lower than expected.

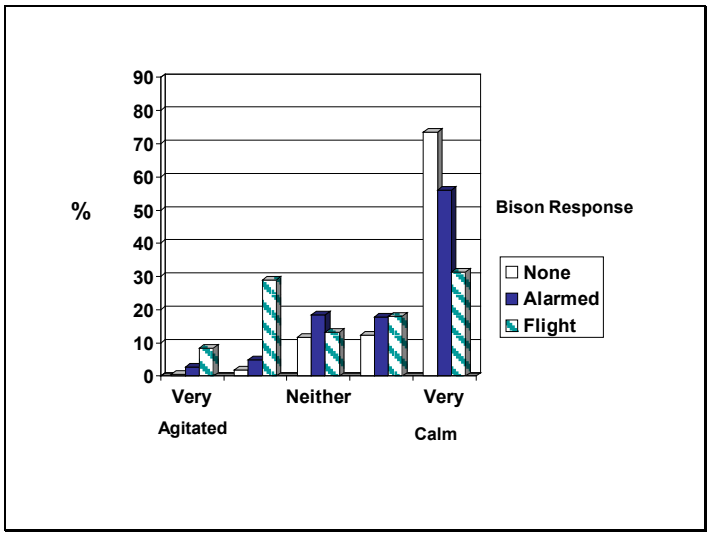


FIGURE 5-7. RELATIONSHIP BETWEEN NATURE OF THE BISON RESPONSE TO HUMANS WITNESSED AND VISITORS' AFFECTIVE APPRAISALS FOR THE MOST SIGNIFICANT HUMAN BISON INTERACTION THE VISITORS OBSERVED

Table 5-5 explores the normative appraisals in relation to the nature of the bison response witnessed. A statistically significant difference ($p < 0.05$) across groups was found for all four of the normative appraisals (indicating that there was a relationship between the nature of bison response observed and the normative appraisal), and a fairly consistent pattern was observed. In all cases, visitors who witnessed an incident in which the bison were "hurried/put to flight/charged humans/vehicles" (i.e., visitors who witnessed the most significant bison responses to humans) were less likely than expected to say the interaction between bison and humans was "very" appropriate (good, well managed, and acceptable) and were more likely than expected to say the interaction was "somewhat" inappropriate (bad, poorly managed, and unacceptable) (see also Figure 5-8 for a graphical representation of this data). In other words, in interactions where bison showed the most significant responses to human presence, normative

appraisals of at least a portion of the visitors become less positive. However, in noting this relationship, it is important to include several caveats. First, even when seeing interactions leading to the most significant bison responses (hurried/flight/charged), more than 50% of the visitors appraised the interaction as "very" appropriate (very well managed, and very acceptable), although less than 50% were willing to call those interactions "very" good. Second, less than 7% or respondents witnessing the most significant types of bison responses appraised these interactions as "very" inappropriate (very bad, very poorly managed, and very unacceptable) and only 7-19% indicated that these interactions were even "somewhat" inappropriate (somewhat bad, somewhat poorly managed, and somewhat unacceptable). In other words, even when considering the most significant, "worst case scenario" events observed, less than 22% of the visitors gave them a negative normative appraisal. The final caveat is a reminder that only 21% of the visitors witnessed the most significant/intense types of bison responses to humans/vehicles (see Table 5-2). In other words the most significant/intense responses were uncommon events according to the sample of visitors.

Table 5-5: Relationship between nature of the bison response to humans witnessed and visitors' normative appraisals for the most significant human bison interaction the visitors observed

	N	Very %	Somewhat %	Neither %	Somewhat %	Very %	P-value[1]
Appropriate/Inappropriate							
Overall	389	72.5	16.7	5.1	3.3	2.3	0.000[2]
None-Brief Notice	166	80.1	13.3	4.8	0.6-[3]	1.2	
Alarmed-unhurried move	138	74.6	16.7	5.1	0.7	2.9	
Hurried-flight-charge	85	54.1-	23.5	5.9	12.9+	3.5	
Bad/Good							
Overall	365	2.2	4.4	17.5	14.2	61.6	0.000[2]
None-Brief Notice	152	1.3	0.0-	15.8	14.5	68.4	
Alarmed-unhurried move	132	3.0	0.8-	17.4	14.4	64.4	
Hurried-flight-charge	81	2.5	18.5+	21.0	13.6	44.4-	
Well Managed/Poorly Managed							
Overall	374	71.4	16.8	5.9	2.4	3.5	0.001[2]
None-Brief Notice	156	75.6	16.0	3.8	1.9	2.6	
Alarmed-unhurried move	136	76.5	16.2	4.4	0.0-	2.9	
Hurried-flight-charge	82	54.9-	19.5	12.2+	7.3+	6.1	
Acceptable/Unacceptable							
Overall	367	75.2	15.0	4.4	3.3	2.2	0.000[2]
None-Brief Notice	154	81.8	14.3	1.9	0.6-	1.3	
Alarmed-unhurried move	132	78.8	15.9	2.3	1.5	1.5	
Hurried-flight-charge	81	56.8-	14.8	12.3+	11.1+	4.9	

[1]P-value is based on a Chi-square analysis comparing visitors according to the most intense interaction they witnessed (based on responses to question 7 on the survey). A nonsignificant p-value ($p > 0.05$) indicates normative appraisal of bison was independent of the significance of the bison response witnessed.

[2]>20% of the cells have expected value less than 5.

[3]Analysis of standardized residuals suggest that shaded cells are the largest contributors to the chi-square statistic, indicating that the value in this cell is significantly different than expected if there were no differences across groups. The +/- indicates whether the observed difference is significantly higher or lower than expected.

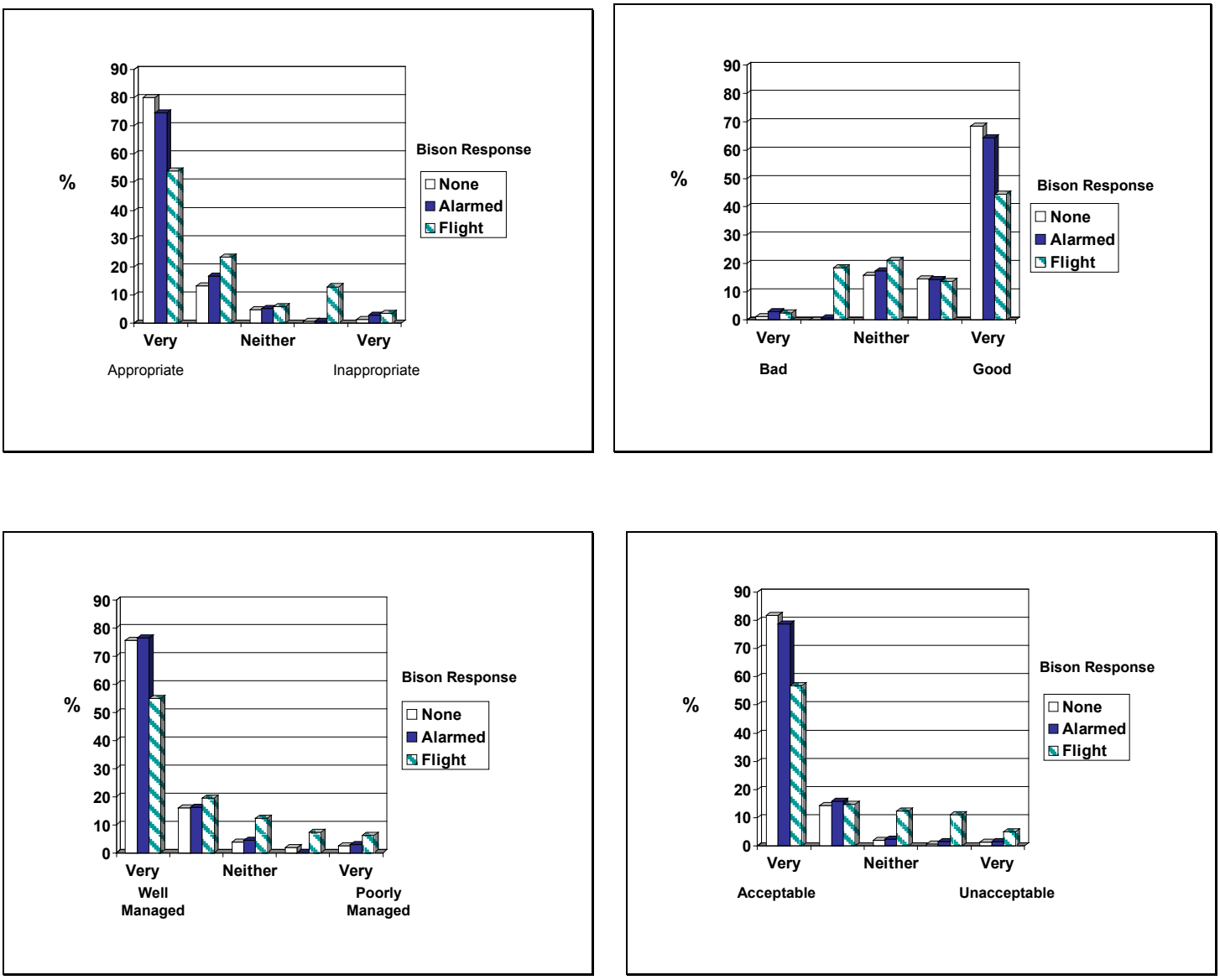


FIGURE 5-8. RELATIONSHIP BETWEEN NATURE OF THE BISON RESPONSE TO HUMANS WITNESSED AND VISITORS' NORMATIVE APPRAISALS FOR THE MOST SIGNIFICANT HUMAN BISON INTERACTION THE VISITORS OBSERVED

Table 5-6 and Figure 5-9 explore the affective appraisals of Yellowstone bison overall in relation to the nature of the bison responses witnessed. A statistically significant difference ($p < 0.05$) across groups was found for three of the five appraisals. First, visitors who witnessed an incident in which the bison were "hurried/put to flight/charged humans/vehicles" were far less likely than expected to say the bison were "very" peaceful (21% compared to 45-61% for the other two groups of visitors) and more likely to say the bison were "somewhat" to "very" stressed (31%compared to 4-11% for the other two groups of visitors). It appears, therefore, that perhaps a single incident may influence visitors' overall appraisals of Yellowstone bison on this dimension. Those seeing the most significant/intense type of reaction from bison were also more likely to see bison as "very" dangerous (24% compared to 11-13% for the other two groups of visitors). Finally, those witnessing the most significant types of responses from bison were more likely to see bison as "somewhat" restricted. However, this relationship appeared to be somewhat less pronounced than the previous two differences – a clear majority of respondents in all groups saw the bison as "very" free.

Table 5-6: Relationship between nature of the bison response to humans witnessed and visitor's affective appraisals of bison overall

	N	Very %	Somewhat %	Neither %	Somewhat %	Very %	P-value[1]
Wild/Tame							
Overall	381	28.1	32.5	15.5	14.2	9.7	0.075
None-Brief Notice	159	23.9	29.6	19.5	12.6	14.5	
Alarmed-unhurried move	137	28.5	37.2	11.7	15.3	7.3	
Hurried-flight-charge	85	35.3	30.6	14.1	15.3	4.7	
Restricted/Free							
Overall	379	1.1	10.8	11.9	9.8	66.5	0.021
None-Brief Notice	159	0.0	8.2	12.6	6.3	73.0	
Alarmed-unhurried move	135	3.0+[3]	9.6	10.4	12.6	64.4	
Hurried-flight-charge	85	0.0	17.6+	12.9	11.8	57.6	
Dangerous/Safe							
Overall	374	14.7	28.3	22.5	17.9	16.8	0.007
None-Brief Notice	156	10.9	22.4	23.1	20.5	23.1+	
Alarmed-unhurried move	133	12.8	32.3	20.3	18.8	15.8	
Hurried-flight-charge	85	23.5+	32.9	24.7	11.8	7.1-	
Authentic/Artificial							
Overall	377	73.2	14.1	6.9	2.7	3.2	0.122[2]
None-Brief Notice	158	74.1	13.9	4.4	2.5	5.1	
Alarmed-unhurried move	135	74.8	11.1	11.1	2.2	.7	
Hurried-flight-charge	84	69.0	19.0	4.8	3.6	3.6	
Stressed/Peaceful							
Overall	377	1.6	11.4	17.2	23.6	46.2	0.000
None-Brief Notice	158	0.6	3.8-	16.5	18.4	60.8+	
Alarmed-unhurried move	134	0.7	10.4	18.7	25.4	44.8	
Hurried-flight-charge	85	4.7+	27.1+	16.5	30.6	21.2-	

[1]P-value is based on a Chi-square analysis comparing visitors according to the most intense interaction they witnessed (based on responses to question 7 on the survey). A nonsignificant p-value ($p > 0.05$) indicates affective appraisal of bison overall was independent of the significance of the bison response witnessed.

[2]>20% of the cells have expected value less than 5.

[3]Analysis of standardized residuals suggest that shaded cells are the largest contributors to the chi-square statistic, indicating that the value in this cell is significantly different than expected if there were no differences across groups. The +/- indicates whether the observed difference is significantly higher or lower than expected.

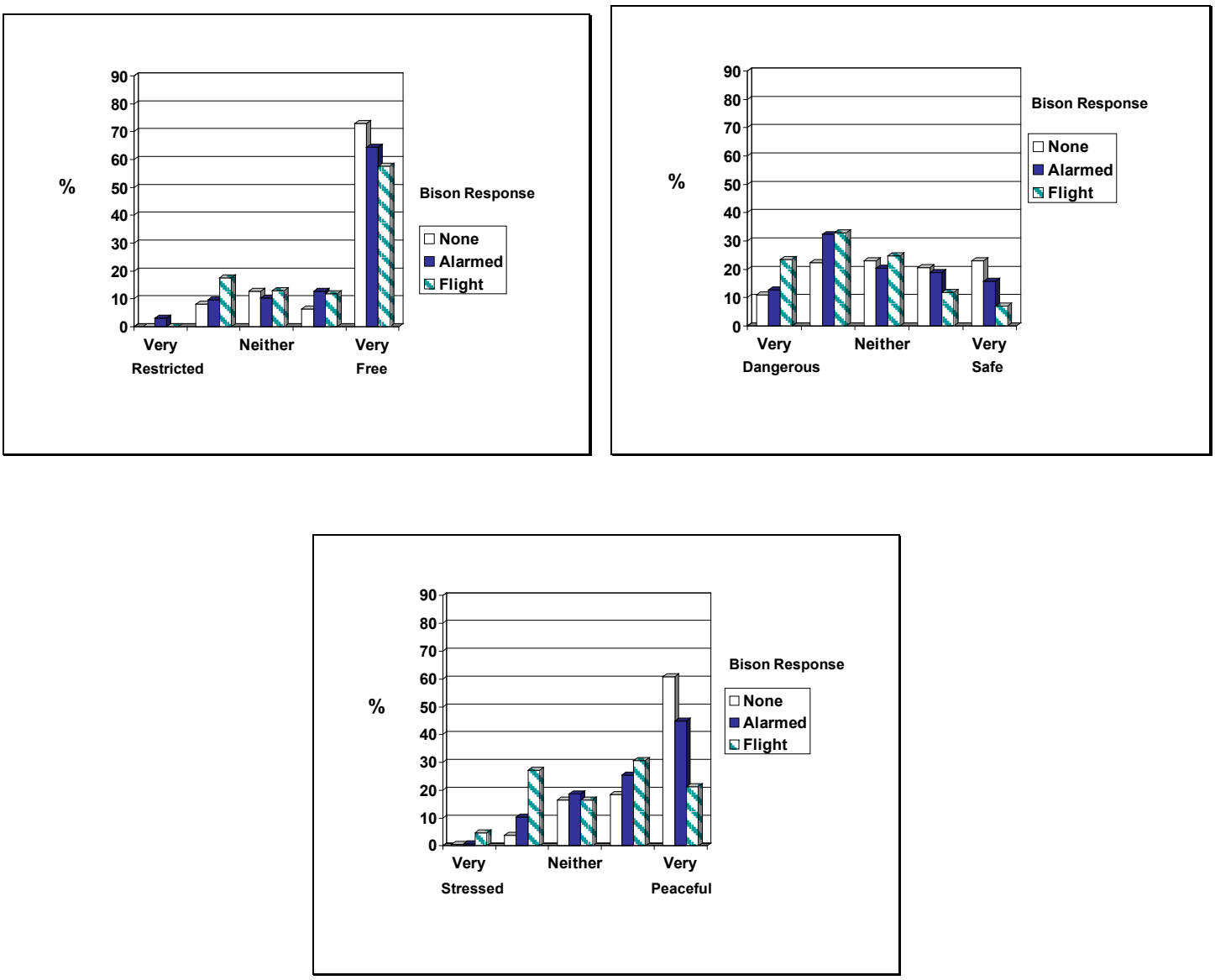


FIGURE 5-9. RELATIONSHIP BETWEEN NATURE OF THE BISON RESPONSE TO HUMANS WITNESSED AND VISITOR'S AFFECTIVE APPRAISALS OF BISON OVERALL

The relationship between the nature of the bison response witnessed and normative appraisals of the park setting overall is examined in Table 5-7. No statistically significant differences ($p > 0.05$) were observed across groups. Thus, while the nature of specific encounters seemed to influence normative judgments about the acceptability of that particular

encounter, these incidents did not seem to rise to the point of influencing the overall normative judgment about the acceptability of the winter setting as a whole.

Table 5-7: Relationship between nature of the bison response to humans witnessed and visitors' normative appraisals of overall winter setting

	N	Very %	Somewhat %	Neither %	Somewhat %	Very %	P-value[1]
Appropriate/Inappropriate							
Overall	380	71.8	18.7	6.6	2.9	0.0	0.616[2]
None-Brief Notice	159	75.5	17.6	4.4	2.5	0.0	
Alarmed-unhurried move	137	71.5	17.5	7.3	3.6	0.0	
Hurried-flight-charge	84	65.5	22.6	9.5	2.4	0.0	
Acceptable/Unacceptable							
Overall	382	75.7	18.6	3.7	1.8	0.3	0.781[2]
None-Brief Notice	160	79.4	14.4	3.8	1.9	0.6	
Alarmed-unhurried move	138	73.2	21.7	3.6	1.4	0.0	
Hurried-flight-charge	84	72.6	21.4	3.6	2.4	0.0	

[1]P-value is based on a Chi-square analysis comparing visitors according to the most intense interaction they witnessed (based on responses to question 7 on the survey). A nonsignificant p-value ($p > 0.05$) indicates normative appraisal of bison was independent of the significance of the bison response witnessed.
[2]>20% of the cells have expected value less than 5.

4.6 Is There a Relationship Between Visitor Appraisals and Primary Activity?

The activities that visitors engage in might also influence the nature of appraisals either because visitors engaged in different activities hold different perspectives or because different activities promote different kinds of interactions. Based on the questions asked in the survey (see questions 3 and 4 in survey in Appendix B), activity (cross country skiing, snowshoeing, snowmobiling, and snowcoach touring) could be represented in two ways: (1) whether or not the visitor engaged in the activity while at Yellowstone and (2) "primary" activity while at Yellowstone. Because all visitors had to enter the park either via snowmobile or snowcoach and because of the possibility that participants engaging primarily in a particular activity might hold different perspectives, primary activity (survey question 4) was deemed to be the better way of representing activity for the following analyses. Due to the relatively small percentage of

visitors engaging in snowshoeing as a primary activity (6.1%) and because the motorized versus nonmotorized distinction was thought to be the factor most likely to drive any potential activity related differences, snowshoers were combined with cross country skiers in the following analyses. Finally, 10% (N=41) of the respondents listed "other" activities as their primary activity. These included things like photography or sightseeing. Because the motorized versus nonmotorized distinction was thought to be the factor most likely to drive any potential activity related differences and it was not possible to classify these "other" respondents according to this dimension, those indicating "other" for primary activity were not included in the following analyses.

The first analysis conducted was to determine whether the importance of the opportunity to view bison differed across primary activity groups. The differences across groups were not statistically significant ($p > 0.05$) (Table 5-8).

Table 5-8: Relationship between primary activity and visitor rating of the importance of the opportunity to view bison.

	N	Not at all Important %	Slightly Important %	Moderately Important %	Very Important %	Extremely Important %	P-value[1]
Opportunity to view bison							
Overall[2]	365	1.9	6.6	20.3	44.9	26.3	0.187
Skiing/ Snowshoeing	90	1.1	4.4	24.4	51.1	18.9	
Snowmobiling	159	1.9	5.0	22.0	40.9	30.2	
Snowcoach Touring	116	2.6	10.3	14.7	45.7	26.7	

[1] P-value is based on a Chi-square analysis comparing visitors according to primary activity (based on responses to question 4 on the survey). A nonsignificant p-value ($p > 0.05$) suggests there was no relationship between primary activity and importance of opportunity to view bison.
[2]The analysis in this table does not include the 41 respondents who indicated "other" for primary activity. These individuals are included in the descriptive summary of responses to the survey in Appendix B.

Table 5-9 and Figure 5-10 explore the relationship between primary activity and affective appraisals of a specific bison encounter (as described above, visitors were asked to respond to the encounter they observed in which bison showed the most intense response to humans). A

statistically significant difference ($p < 0.05$) across groups was found for one of the three appraisals. Snowmobilers were more likely than expected to say the bison were "very" calm while skiers/snowshoers were more likely than expected to say bison were somewhat agitated.

Table 5-9: Relationship between primary activity and visitors' affective appraisals for the most significant human bison interaction the visitors observed

	N	Very %	Somewhat %	Neither %	Somewhat %	Very %	P-value[1]
Health/Unhealthy							
Overall[3]	356	71.3	24.4	2.2	2.0	0.0	0.533[2]
Skiing/Snowshoeing	86	70.9	23.3	3.5	2.3	0.0	
Snowmobiling	154	75.3	22.1	0.6	1.9	0.0	
Snowcoach Touring	116	66.4	28.4	3.4	1.7	0.0	
Agitated/Calm							
Overall[3]	347	2.9	7.8	14.1	15.0	60.2	0.008
Skiing/Snowshoeing	86	2.3	15.1+[4]	16.3	18.6	47.7	
Snowmobiling	149	2.7	4.0	11.4	10.1	71.8+	
Snowcoach Touring	112	3.6	7.1	16.1	18.8	54.5	
Active/Inactive							
Overall[3]	346	15.9	53.8	9.8	15.0	5.5	0.150
Skiing/Snowshoeing	85	10.6	61.2	9.4	15.3	3.5	
Snowmobiling	147	13.6	51.7	10.2	15.6	8.8	
Snowcoach Touring	114	22.8	50.9	9.6	14.0	2.6	

[1] P-value is based on a chi-square analysis comparing visitors according to primary activity (based on responses to question 4 on the survey). A nonsignificant p-value ($p > 0.05$) indicates that the affective appraisal was not related to the primary activity.

[2] >20% of the cells have expected value less than 5.

[3] The analysis in this table does not include the 41 respondents who indicated "other" for primary activity. These individuals are included in the descriptive summary of responses to the survey in Appendix B.

[4] Analysis of standardized residuals suggest that shaded cells are the largest contributors to the chi-square statistic, indicating that the value in this cell is significantly different than expected if there were no differences across groups. The +/- indicates whether the observed difference is significantly higher or lower than expected.

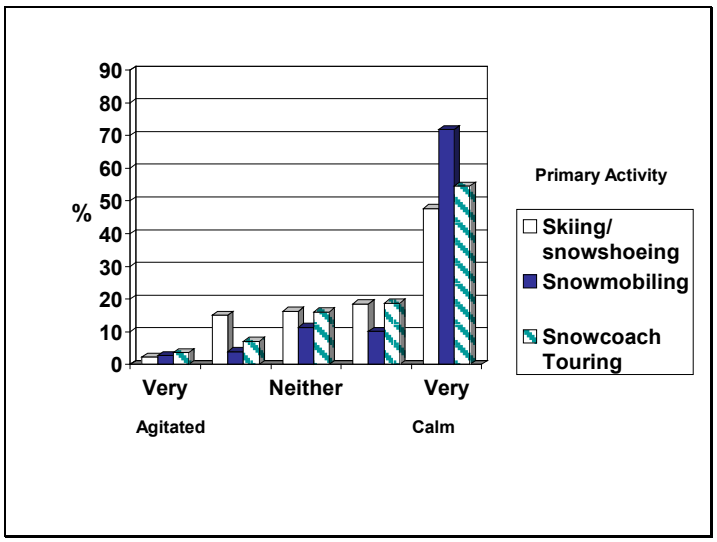


FIGURE 5-10. RELATIONSHIP BETWEEN PRIMARY ACTIVITY AND VISITORS' AFFECTIVE APPRAISALS FOR THE MOST SIGNIFICANT HUMAN BISON INTERACTION THE VISITORS OBSERVED

The only normative appraisal exhibiting a statistically significant ($p < 0.05$) difference was the "appropriate/inappropriate" appraisal (Table 5-10). Analysis of the standardized residuals suggested the most important distinction between the primary activity groups was that skiers/snowshoers were higher than expected in the "somewhat" inappropriate grouping. However, this was a difference of 8% of skiers/snowshoers compared to 1-2% of the motorized users. And among all the primary user groups, over 60% of respondents found the interactions appropriate (Table 5-10, Figure 5-11).

Table 5-10: Relationship between primary activity and visitors' normative appraisals for the most significant human bison interaction the visitors observed

	N	Very %	Somewhat %	Neither %	Somewhat %	Very %	P-value[1]
Appropriate/Inappropriate							
Overall[3]	349	73.1	17.2	4.9	3.2	1.7	0.009[2]
Skiing/Snowshoeing	84	63.1	22.6	6.0	8.3+[4]	0.0	
Snowmobiling	153	81.0	13.1	3.3	1.3	1.3	
Snowcoach Touring	112	69.6	18.8	6.3	1.8	3.6	
Bad/Good							
Overall[3]	325	1.8	4.0	16.6	15.7	61.8	0.053[2]
Skiing/Snowshoeing	77	0.0	7.8	20.8	20.8	50.6	
Snowmobiling	144	1.4	2.1	12.5	14.6	69.4	
Snowcoach Touring	104	3.8	3.8	19.2	13.5	59.6	
Well Managed/Poorly Managed							
Overall[3]	334	72.2	17.1	5.4	2.1	3.3	0.112[2]
Skiing/Snowshoeing	82	58.5	24.4	9.8	3.7	3.7	
Snowmobiling	146	77.4	15.1	4.1	0.7	2.7	
Snowcoach Touring	106	75.5	14.2	3.8	2.8	3.8	
Acceptable/Unacceptable							
Overall[3]	327	76.8	15.0	4.0	2.8	1.5	0.208[2]
Skiing/Snowshoeing	77	64.9	23.4	6.5	3.9	1.3	
Snowmobiling	145	83.4	11.0	2.1	2.1	1.4	
Snowcoach Touring	105	76.2	14.3	4.8	2.9	1.9	

[1] P-value is based on a Chi-square analysis comparing visitors according to primary activity (based on responses to question 4 on the survey). A nonsignificant p-value ($p > 0.05$) indicates that the normative appraisal was not related to the primary activity.

[2] >20% of the cells have expected value less than 5.

[3] The analysis in this table does not include the 41 respondents who indicated "other" for primary activity. These individuals are included in the descriptive summary of responses to the survey in Appendix B.

[4] Analysis of standardized residuals suggest that shaded cells are the largest contributors to the chi-square statistic, indicating that the value in this cell is significantly different than expected if there were no differences across groups. The +/- indicates whether the observed difference is significantly higher or lower than expected.

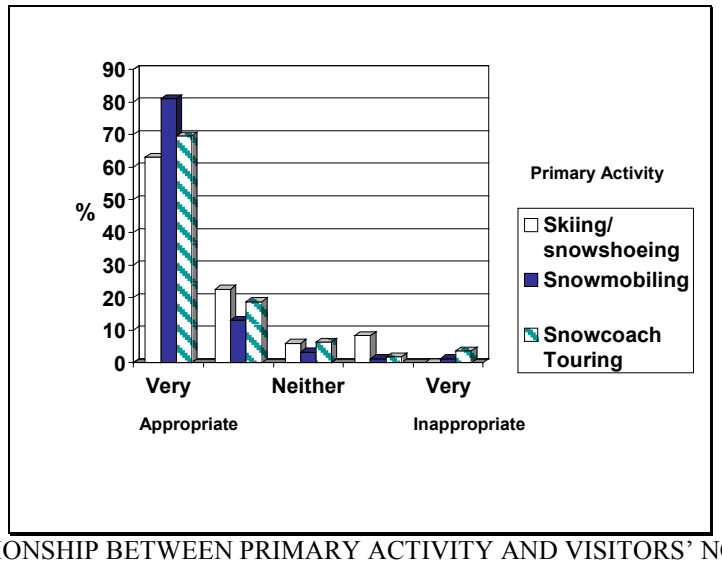


FIGURE 5-11. RELATIONSHIP BETWEEN PRIMARY ACTIVITY AND VISITORS' NORMATIVE APPRAISALS FOR THE MOST SIGNIFICANT HUMAN BISON INTERACTION THE VISITORS OBSERVED

Table 5-11 and Figure 5-12 explore the visitors' affective appraisals of Yellowstone bison overall in relation to the visitors' primary activity. A statistically significant difference ($p < 0.05$) across groups was found for all five appraisals. The two most notable differences had to do with the appraisals "stressed/peaceful" and "dangerous/safe". Snowmobilers were far more likely than expected to say the bison were "very" peaceful (67%) compared to skiers/snowshoers (26%) while skiers/snowshoers were more likely to say bison were "somewhat" stressed (26% compared to 6% of snowmobilers). On the dangerous/safe dimension, 60% of skiers/snowshoers rated bison as either "very" or "somewhat" dangerous compared to only 23% of the snowmobilers. In contrast, 53% of the snowmobilers indicated bison were "very" or "somewhat" safe. In contrast to the stressed/peaceful and dangerous/safe appraisals, the differences across affective appraisals regarding bison experiences in YNP overall were somewhat less dramatic. Snowmobilers were more likely to say bison were "very" tame than were skiers/snowshoers (15% versus 4%) and correspondingly less likely to say bison were "very" wild (18% versus 35%). Over two-thirds of visitors in all groups ($\geq$68%) found the bison "very" authentic, but skiers/snowshoers were more likely than motorized users to say bison were only "somewhat" authentic (23% versus 8-13%) and snowmobilers were more likely to say "very" artificial (but only 6% versus 1-

2% for the other primary activity groups). Finally, on the restricted/free appraisal skiers/snowshoers were more likely to say bison were somewhat restricted compared to snowmobilers (18.4% versus 6%), but a majority of visitors in all users groups (≥ 56%) felt bison were "very" free.

Table 5-11: Relationship between primary activity and visitor's affective appraisals of bison overall

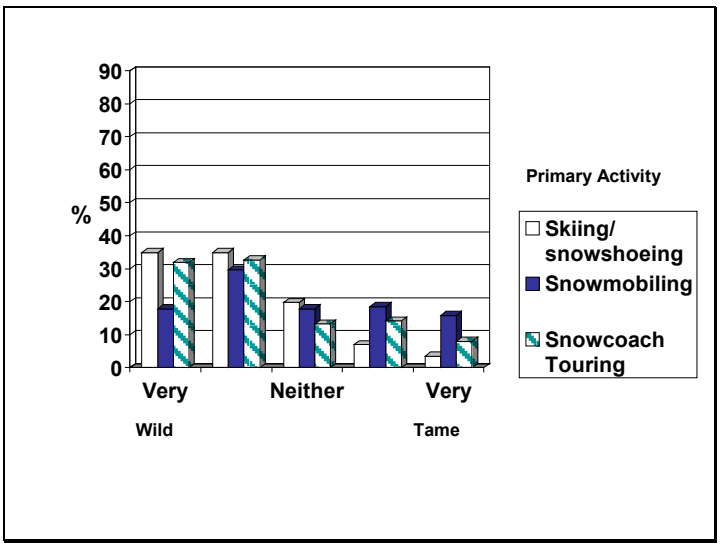
	N	Very %	Somewhat %	Neither %	Somewhat %	Very %	P-value[1]
Wild/Tame							
Overall[3]	344	26.7	32.0	16.9	14.2	10.2	0.003
Skiing/Snowshoeing	86	34.9	34.9	19.8	7.0-[4]	3.5-	
Snowmobiling	145	17.9-	29.7	17.9	18.6	15.9+	
Snowcoach Touring	113	31.9	32.7	13.3	14.2	8.0	
Restricted/Free							
Overall[3]	342	0.6	10.8	11.1	9.9	67.5	0.021
Skiing/Snowshoeing	87	1.1	18.4+	9.2	14.9	56.3	
Snowmobiling	144	0.0	5.6-	10.4	6.9	77.1	
Snowcoach Touring	111	0.9	11.7	13.5	9.9	64.0	
Dangerous/Safe							
Overall[3]	338	13.9	26.3	23.4	18.6	17.8	0.000
Skiing/Snowshoeing	85	23.5+	36.5+	21.2	9.4-	9.4-	
Snowmobiling	142	4.2-	19.0	23.9	25.4+	27.5+	
Snowcoach Touring	111	18.9	27.9	24.3	17.1	11.7	
Authentic/Artificial							
Overall[3]	340	73.2	13.8	6.5	2.9	3.5	0.012[2]
Skiing/Snowshoeing	87	70.1	23.0+	3.4	2.3	1.1	
Snowmobiling	143	67.8	12.6	9.1	4.2	6.3+	
Snowcoach Touring	110	82.7	8.2	5.5	1.8	1.8	
Stressed/Peaceful							
Overall[3]	340	1.2	10.9	17.9	22.1	47.9	0.000
Skiing/Snowshoeing	86	2.3	25.6+	19.8	26.7	25.6-	
Snowmobiling	141	0.7	5.7-	9.2	17.7	66.7+	
Snowcoach Touring	113	0.9	6.2	27.4+	23.9	41.6	

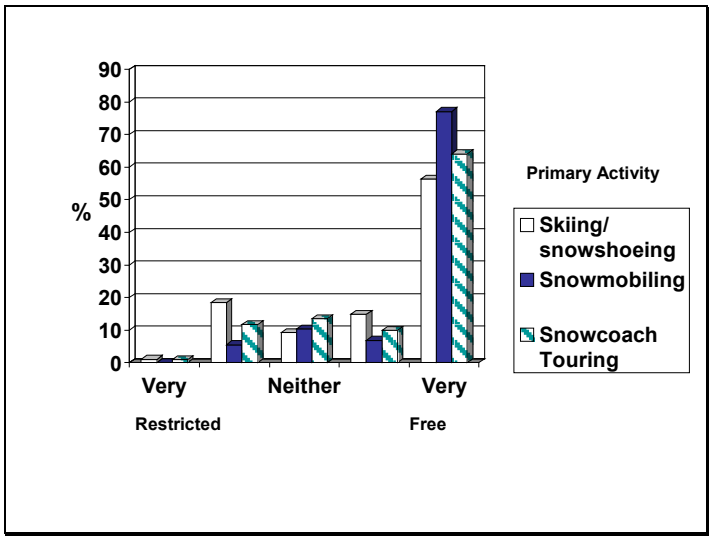
[1] P-value is based on a Chi-square analysis comparing visitors according to primary activity (based on responses to question 4 on the survey). A nonsignificant p-value ($p > 0.05$) indicates that the affective appraisal was not related to the primary activity.

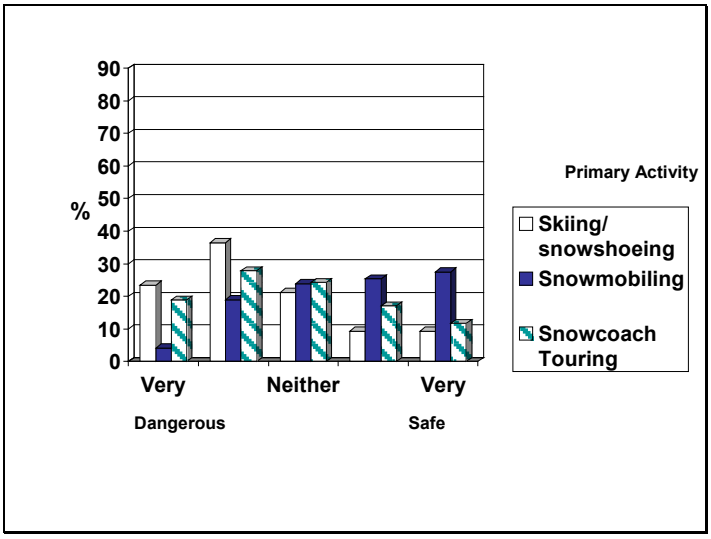
[2] >20% of the cells have expected value less than 5.

[3] The analysis in this table does not include the 41 respondents who indicated "other" for primary activity. These individuals are included in the descriptive summary of responses to the survey in Appendix B.

[4] Analysis of standardized residuals suggest that shaded cells are the largest contributors to the chi-square statistic, indicating that the value in this cell is significantly different than expected if there were no differences across groups. The +/- indicates whether the observed difference is significantly higher or lower than expected.







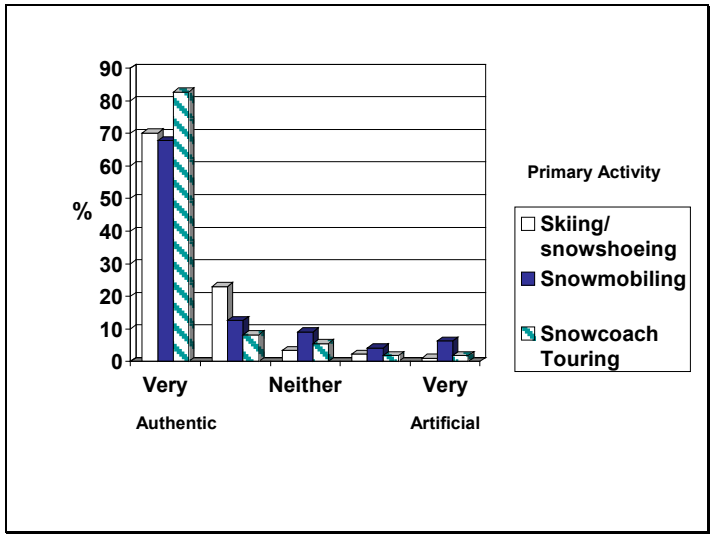


Table 5-12: Relationship between primary activity and visitor's affective appraisals of bison overall, (continued next page).

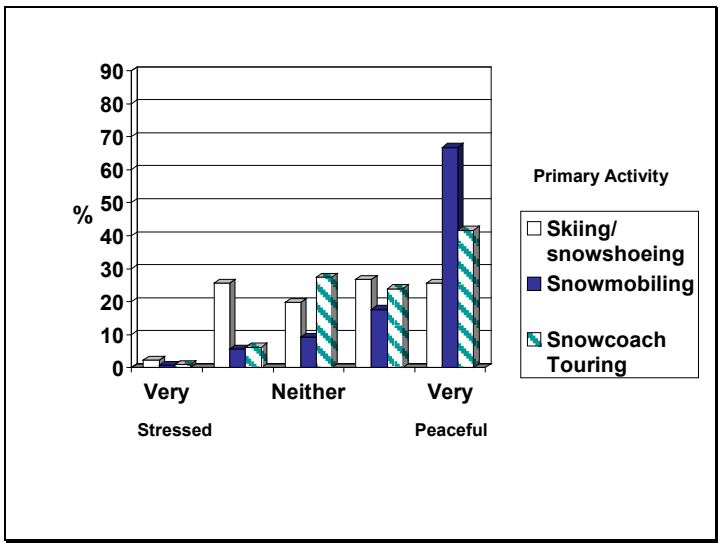


FIGURE 5-12. (CONTINUED). RELATIONSHIP BETWEEN PRIMARY ACTIVITY AND VISITOR'S AFFECTIVE APPRAISALS OF BISON OVERALL

The relationship between primary activity and normative appraisals of the park setting overall is examined in Table 5-12 and Figure 5-13. Statistically significant differences ($p < 0.05$) were observed across groups. However, from a practical standpoint the differences were not dramatic. In all groups less than 1% of respondents indicated that the setting was "very" inappropriate/unacceptable while a clear majority ($\geq$61%) indicated the setting was "very" appropriate/acceptable. Analysis of the standardized residuals suggest the statistically significant differences in both appraisals was most strongly driven by a higher than expected level of skiers/snowshoers in the "somewhat" inappropriate and "somewhat" unacceptable categories (6-7% compared to 1% of the snowmobilers and 1 to 4% of the snowcoach riders).

Table 5-12: Relationship between primary activity and visitors' normative appraisals of overall winter setting

	N	Very %	Somewhat %	Neither %	Somewhat %	Very %	P-value[1]
Appropriate/Inappropriate							
Overall[3]	346	72.3	18.5	6.1	3.2	0.0	0.023[2]
Skiing/Snowshoeing	87	60.9	25.3	6.9	6.9[+4]	0.0	
Snowmobiling	150	80.7	13.3	5.3	0.7	0.0	
Snowcoach Touring	109	69.7	20.2	6.4	3.7	0.0	
Acceptable/Unacceptable							
Overall[3]	348	75.9	18.4	3.4	2.0	0.3	0.010[2]
Skiing/Snowshoeing	88	64.8	27.3[+]	2.3	5.7[+]	0.0	
Snowmobiling	151	83.4	12.6	3.3	0.7	0.0	
Snowcoach Touring	109	74.3	19.3	4.6	0.9	0.9	

[1] P-value is based on a Chi-square analysis comparing visitors according to primary activity (based on responses to question 4 on the survey). A nonsignificant p-value ($p > 0.05$) indicates that the normative appraisal was not related to the primary activity.
[2]>20% of the cells have expected value less than 5.
[3]The analysis in this table does not include the 41 respondents who indicated "other" for primary activity. These individuals are included in the descriptive summary of responses to the survey in Appendix B.
[4]Analysis of standardized residuals suggest that shaded cells are the largest contributors to the chi-square statistic, indicating that the value in this cell is significantly different than expected if there were no differences across groups. The +/- indicates whether the observed difference is significantly higher or lower than expected.

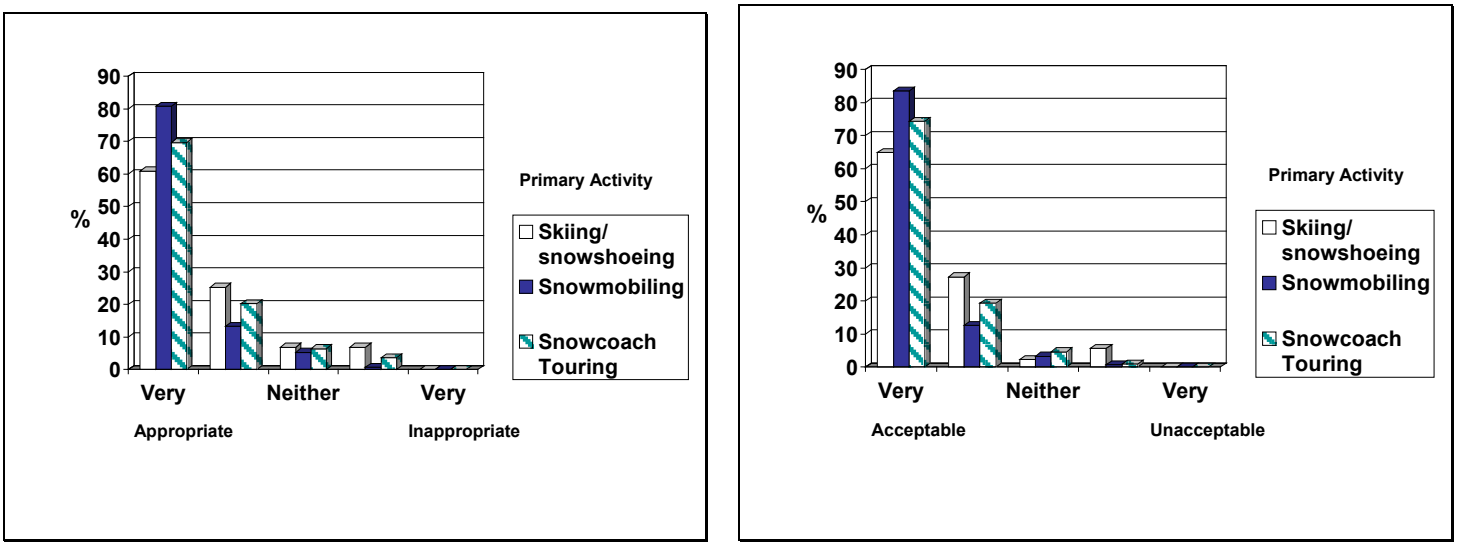


FIGURE 5-13. RELATIONSHIP BETWEEN PRIMARY ACTIVITY AND VISITORS' NORMATIVE APPRAISALS OF OVERALL WINTER SETTING

4.7 Is There a Relationship between Appraisals and Type of Community Visitors Are From?

Perceptions of wildlife related issues may be influenced by the social community in which one lives. Specifically, it is often thought that rural and urban residents hold different perspectives on many wildlife issues. Therefore, this visitor characteristic was explored in relation to visitors' affective and normative appraisals of bison. A chi-square analysis was used again and visitors were placed into three groups based on their descriptions of the types of communities they currently live in (Question 22 of the survey): farm or ranch-rural (<1000 population), town-small city (1000-50,000), and medium city-major city (50,000->1,000,000). Across all the appraisals, only three statistically significant differences ($p < 0.05$) were evident. Table 5-13 below presents only those appraisals for which statistically significant differences were observed.

The first variable for which there is a statistically significant relationship was an affective appraisal in relation to the most significant bison response the visitor observed. Analysis of standardized residuals suggests that visitors from medium/major cities were more likely than expected to not take a position (i.e., to say "neither" agitated nor calm - 22%) while visitors from towns/small cities were less likely than expected to not take a position (7%) and more likely than expected to say "somewhat" calm (23% compared to 10-12% for the other resident groups). However, the majority of visitors in all community groups (53-69%) found bison "very" calm. A second statistically significant difference was observed for the appropriate/inappropriate appraisal in relation to the community in which respondents currently lived. However, while the overall chi-square attained statistical significance, none of the standardized residuals stood out as indicating a strong difference, and the majority of visitors in all groups (70-77%) found the

interactions observed to be "very" appropriate. The final variable demonstrating a statistically significant difference was the overall appraisal of bison as restricted/free. However, once again the differences were not dramatic in a practical sense. The majority in all groups (56-70%) indicated bison were "very" free and standardized residuals suggested the greatest difference was small town residents being less likely to say that bison were only "somewhat" free (3% versus 13-14%). Overall, the type of community from which visitors originated seemed to have little influence on appraisals – it was not related to most types of appraisals and what few statistically significant relationships were found showed neither strong nor consistent patterns.

Table 5-13: Relationship between type of community where visitors currently reside and their appraisals of bison

	N	Very %	Somewhat %	Neither %	Somewhat %	Very %	P-value[1]
Agitated/Calm							
Overall	374	3.2	8.8	14.7	15.2	58.0	0.001
Farm/Ranch/Rural	70	5.7	5.7	10.0	10.0	68.6	
Town/Small City	118	3.4	6.8	6.8-[3]	22.9+	60.2	
Medium/Major City	186	2.2	11.3	21.5+	12.4	52.7	
Appropriate/Inappropriate							
Overall	375	72.5	17.1	4.8	3.2	2.4	0.044[2]
Farm/Ranch/Rural	68	70.6	20.6	5.9	1.5	1.5	
Town/Small City	124	77.4	11.3	8.1	0.8	2.4	
Medium/Major City	183	69.9	19.7	2.2	5.5	2.7	
Restricted/Free							
Overall	370	1.1	10.5	11.6	10.0	66.8	0.029
Farm/Ranch/Rural	63	0.0	17.5	14.3	12.7	55.6	
Town/Small City	123	1.6	11.4	13.8	3.3-	69.9	
Medium/Major City	184	1.1	7.6	9.2	13.6	68.5	

[1] P-value is based on a Chi-square analysis comparing visitors according to type of community they live (based on responses to question 22 on the survey). Only analyses with significant p-values ($p < 0.05$) are presented.
[2] >20% of the cells have expected value less than 5.
[3] Analysis of standardized residuals suggest that shaded cells are the largest contributors to the chi-square statistic, indicating that the value in this cell is significantly different than expected if there were no differences across groups. The +/- indicates whether the observed difference is significantly higher or lower than expected.

4.8 Is There a Relationship Between Appraisals and Values Visitors' Hold Regarding Bison?

Appraisals of human-bison interactions observed may be influenced by the types of values visitors associate with bison. Question 16 of the survey (see Appendix B) explored values related to bison that visitors hold. These items were examined using factor analysis and reliability analysis (Cronbach's alpha) to determine if the values grouped into a smaller set of dimensions. In other words, these analyses ask if there are distinct and reliable groups or types of values. The analyses indicated that there were two distinct types of values that also appeared to be reliable (internally consistent) measures.

The first type of value was comprised of 9 of the original items and collectively reflected the cultural/heritage values of bison (e.g., "bison are an important part of American Identity", "bison are an important part of Native American heritage", "it is important to maintain bison populations in YNP for the enjoyment of future generations", etc.). The original intention for analysis was to see if there was a relationship between this type of value and visitor appraisals. However, there was very little variation among visitors on the items comprising this value set. Ninety percent or more of the visitors agreed with each value statement comprising the cultural/heritage value type. Therefore, what variation did occur was primarily between the "strongly" and "moderately" agree. However, 60-87 % of visitors strongly agreed with all statements in this value group. As a consequence, there was not enough variation in views on this type of value to make an analysis of visitor appraisals in relation to cultural/heritage values worth examining.

The second distinct and reliable value type reflected more individualized emotional and spiritual types of values ("I feel a strong emotional bond to bison" and "bison have a spiritual importance to me"). On these items there was much greater distribution of visitors across the response scale- the largest portion responding neutral (44-47%) but 20-30% disagreeing and 22-36% agreeing. As a result chi-square analyses were conducted using the value item that loaded most highly on this factor in the factor analysis ("I feel a strong emotional bond to bison"). To conduct these chi-square analyses, visitors were placed into three groups according to their response to this value statement. The three groups were: "agree" (combining strongly/moderately responses), "disagree" (combining strongly/moderately responses), and "neither" (agree nor disagree). No statistically significant differences were observed across any of the affective or normative appraisals for visitors grouped according to this type of individual emotional values. In other words, differences among visitors in relation to this type of value construct for bison did not appear to be a driving factor in regard to visitors' affective or normative appraisals.

4.9 Summary – Winter Visitor Impressions of Bison and Bison Interactions

The survey results suggest that the opportunity to view bison remains an important part of the winter experience for visitors to Yellowstone National Park (71% of visitors described it as very to extremely important). And visitors overwhelmingly (87%) find this aspect of their Yellowstone winter experience very satisfying.

When asked to describe their interactions with bison, by the time they reach Old Faithful, the typical visitor has seen bison on 6-8 different occasions. During these viewing opportunities, 99% of the visitors have at least one encounter in which bison appeared not to react to humans in

a significant way and only 21% of visitors have witnessed an encounter where the bison were hurried, took flight, or acted defensively (the three most intense bison responses examined in the survey). And overall, visitors overwhelmingly (>72%) appraised both the bison human interactions they witnessed and the park setting as a whole as "very" appropriate/acceptable.

There does appear to be a relationship between the nature of the human-bison interaction visitors witness and visitor appraisals of those interactions. When asked to appraise the human bison interaction they witnessed where the bison showed the most intense response, those seeing the most intense responses from bison (hurried, took flight, or were defensive) are: (1) more likely than expected to describe the bison in the specific incident as agitated (37% compared to 2% for the group of visitors for which "no response" from bison was observed) and (2) are more likely to describe bison in the park overall as stressed (32% compared to 4% for the group of visitors for which "no response" from was bison observed"). Those seeing the most intense response also are more likely to describe the bison overall as somewhat to very dangerous (56% versus 33%). Further, there is a relationship between the intensity of bison response to humans witnessed in a particular interaction and normative judgments about acceptability/appropriateness of those specific interactions (as a group those who witness the most intense bison response are less likely to find them "very" acceptable/appropriate and more likely to say "somewhat" inappropriate). Even so, the majority (72-78%) of the 21% of visitors who witnessed the most intense bison responses described the incidents as "somewhat" to "very" acceptable/appropriate.

Primary activity (skiing/snowshoeing versus snowmobiling versus snowcoach touring) does not appear to have as strong or consistent an influence of appraisals of specific human-bison interactions as the nature/intensity of encounter summarized above. However, in

comparison to specific encounters, primary activity does appear to exert more of an influence on overall appraisals of bison in Yellowstone as a whole. The two most notable differences had to do with the appraisals "stressed/peaceful" and "dangerous/safe". Snowmobilers were more likely to say the bison were "very" peaceful (67%) than were skiers/snowshoers (26%) while skiers/snowshoers were more likely to say bison were "somewhat" stressed (26% compared to 6% of snowmobilers). On the dangerous/safe dimension, 60% of skiers/snowshoers rated bison as either "very" or "somewhat" dangerous compared to 53% of the snowmobilers saying bison were "very" or "somewhat" safe.

Finally, differences in appraisals resulting from type of community in which visitors currently reside and "wildlife values" specifically for bison as measured in the survey were explored, but these factors were not found to be significant influences.

5 WINTER GUIDE PERCEPTIONS OF CURRENT VISITOR MANAGEMENT POLICIES

5.1 A Framework for Analyzing Guiding Policy

The implementation of a guided management regime as part of the winter use plans for Yellowstone National Park means that all visitors using the park in the winter are required to use a snowmobile or snowcoach guide. Therefore, guides play a significant role in the winter visitor experience in Yellowstone National Park. In addition, many of the guides working in the park have experienced conditions in the park before and after the institution of the guided management regime and can give an historical perspective on the efficacy of the winter use policies with respect to protecting wildlife and providing a satisfactory visitor experience.

One limitation to the research is that the guides' perspective is limited in scope and perhaps biased as the guiding requirements provides a source of employment. However, it is still important to understand guides' perceptions of the efficacy of winter use policies in Yellowstone because guides have an influence on visitors and mediate visitor experiences. They also have 'on the ground' knowledge of conditions in the park. This section will explore the literature relating to guides in order to establish the roles of guides in general, the extent and type of influence guides have on visitors, and how guides mediate visitor experiences in order to make the argument that although guides only provide a partial perspective on winter use policies, their perspective is influential for visitors and therefore important for managers to understand.

The role of tour guides was explored in detail in a seminal article by Cohen (1985). In this article, Cohen established two roles for guides, the pathfinder and the mentor. In the pathfinder role, guides act to show the way for their clients, providing a sense of security in an unfamiliar environment (Cohen 1985, McDonnell 2001). The pathfinder provides privileged access to places not usually accessible to the public. In contemporary guiding situations, Cohen (1985) has described that role as that of a leader. The leader is concerned with the instrumental functions of guiding; those involved in getting tourists to and from their destination safely. Therefore, in the pathfinder role, guides are outwardly directed towards the physical environment (Cohen 1984). While guides still perform this role, Cohen (1984) argues that today's professional guides act as mentors more than pathfinders. As a mentor, the guide is concerned with the transmission and interpretation of information and is inwardly directed towards the group, helping to give tourists meaning to what they see (Cohen 1984; 1985, Cohen, Ifergan and Cohen 2002, McDonnell 2001). Cohen (1985) further divided the mentoring role of the guide into four components. The first is the selection by the guide and the tour operator of what the

tourists see and do not see. The guide might select particular experiences based on what s/he thinks the tourist wants to see and therefore will influence, through selection, how a destination is represented to the clients (Cohen 1985, Cohen, Ifergan and Cohen 2002). The second component is information. This is considered by Cohen (1985) to be the core of the guides' role. Guides are responsible for disseminating correct and precise information about the destination and therefore are also important sources of information regarding touristic and social conditions of a destination (Nettekoven 1979). In conjunction with information is the third component, interpretation. Cohen (1985) considers interpretation to be the most important communicative function of guides. As Moscadaro (1996) explains, the goal of interpretation is to produce visitors who are attentive, willing to gain new insights, and ultimately to broaden their understanding of the area they visit. However, guides can also fabricate experiences for tourists and this is the fourth component of Cohen's (1985) role of the guide as mentor. The fabrication component highlights the power that guides have in shaping an experience for clients and points out that guides are seen by tourists as experts and thus their information and interpretations are treated as such. The role of the guide as a mentor is based in communicating the landscape to tourists.

Arnould, Price and Tierney (1998) provide a detailed analysis of the communication between guides and clients through the idea of communicative staging. In their article, the authors describe communicative staging as an important component of the production of wilderness servicescapes or places where wilderness is commercialized. The authors define communicative staging as "ways in which the environment is presented and interpreted" (Arnould, Price and Tierney 1998: 90). Their argument is that communicative staging plays an important role in the production of wilderness servicescapes. Their study took place in Dinosaur

National Monument, a servicescape that provides business opportunities for outfitters conducting white water trips on the Yampa and Green rivers. Much like Yellowstone National Park, Arnould, Price and Tierney (1998) describe the servicescape of Dinosaur National Monument as privileging preservation of the area over customer needs and wants. Service providers are under a mandate to minimize human impacts on the environment. The results of the study provide two important conclusions that help explain the relationship between guides and clients and the influence that guides have on clients. The results suggest that clients unfamiliar with the setting will look to guides for cues on how to interpret their experiences. Second, the authors conclude that guides influence customers by communicating certain wilderness themes in preparation for the experience. The authors explain their findings as: "We hypothesize that in any service where the servicescape is fore-grounded, communicative staging can add value. In other words, everybody needs a guide" (Arnould, Price and Tierney 1998: 112). In the context of winter use in Yellowstone, the natural environment is in the foreground of the servicescape and the preservation of the area is mandated through the current policies. As such, guides help to produce a servicescape where wilderness themes are communicated to clients and these themes influence client experiences. The implication is that guides are necessary to convey ideas of preservation of the environment to clients during their wilderness experiences.

Research conducted on the role of ecotour guides also contributes to the discussion that guides influence and mediate visitor experiences. Although the experience of guided excursions in Yellowstone is not labeled as ecotourism, it is a form of nature-based tour and shares the characteristics of being educational and oriented towards sustainability with ecotours. Ecotour guides are integral in shaping visitor attitudes toward environmental protection and as such, their knowledge, communication skills and interpretive abilities help to increase visitor knowledge,

influence attitudes and behavior and enhance visitor satisfaction (Ballantyne et al. 2000). In addition to their role in shaping visitor attitudes, Wiler and Davis (1993) argue that ecotour guides also act as motivators, encouraging environmentally responsible behavior and interpreters, presenting information in such a way that clients gain environmental understanding and appreciation. By doing so, guides model environmentally responsible behavior and promote positive attitudes towards environmental protection (Ballantyne et al. 2000, Ballantyne and Hughes 2001, Crabtree 2000, Weaver 2001). Ballantyne and Hughes (2001) conducted a study of 65 Australian ecotour guides, having them fill out a questionnaire about their perceptions of the role of an ecotour guide. They found that the most common response was to inform visitors. Following that, guides viewed their role as providing an enjoyable experience, facilitating effective communication, ensuring safety, and stimulating the interest of visitors.

In summary, the literature suggests that the guide acts primarily as a mentor, providing information and interpretation, thus shaping the client's experience (Cohen 1984; 1985, Cohen, Ifergan and Cohen 2002, McDonnell 2001). Arnould, Price and Tierney (1998) note that clients look to guides for cues on how to interpret their experience and that guides achieve this by communicating certain wilderness themes while preparing clients for their experience. The research conducted by Ballantyne and Hughes (2001) suggests that guides also view themselves in the role of interpreter, influencing and mediating visitor attitudes and behaviors through the information they provide. In the case of the Yellowstone winter visitor experience, guides play a significant role in influencing visitor perceptions of the park through the provision of information that interprets the environment for their clients.

5.2 Research Design

The purpose of this study was to document the perception that winter guides to Yellowstone National Park have of the effectiveness of recent policy changes in achieving environmental protection while promoting satisfactory visitor experiences. Many guides to Yellowstone National Park, who are all employed by private companies, have guided in the park for extended amounts of time. Thus, they may be able to provide a unique insight to effectiveness of park management relative to changes in the visitor experience and park setting as a result of the new winter management regime. Park management is interested in understanding these perspectives as a component of their adaptive management monitoring.

In order to effectively gauge the perceptions of guides towards the policy changes in Yellowstone National Park, an interview method was used for data collection. This method was chosen for several reasons. First, interviews provide an in-depth and flexible approach to data collection that allows for exploration of relevant issues and meanings. Interviews also allow the researcher to probe more deeply and/or clarify responses in order to uncover issues that are relevant to the research. Finally, interviews can produce rich and context-dependent data that allow the researcher to uncover unexpected issues or, in this case perceptions related to the topic. In this case, where the research is exploratory, interviews provide a more appropriate data collection method than survey questionnaires because they do not impose categorical responses.

The types of questions asked in the interviews were based around three policies regarding winter use: impacts of clean and quiet technology, the guiding requirements and group size limitations. Within each of these three topics, guides were asked questions about how each of the above policies impacted (in their opinion) visitor experiences and wildlife. In addition, guides were asked about the changes occurring due to each policy and if/how their clients

commented on the policies. Finally, guides were asked if they thought that there was a different type of client in the park due to the policies and if they had suggestions for park management (See appendix-1).

The data collection component of the study was carried out in January of 2008 in the Old Faithful area. This area acts as a collection point for both snowmobile and snow coach tours as most come for lunch and to watch the geysers. Guides were approached in various places such as the parking lot, Visitor's Center, lodge and gas station. Although the interview process was anonymous, it was important to find respondents from a range of companies as well as a mix of snowmobile and snowcoach drivers. Overall, the guides were cooperative and articulate. Over the ten-day period of data collection, twenty-two guides were approached for interviews and all agreed to be participants. They were eager to share their knowledge on the subject and were frank about their opinions. The respondents represented a wide range of experience guiding in the park from two weeks to twenty-seven years. Given that only 80 to 90 guides work regularly in Yellowstone in the winter and that Old Faithful is only one location in the Park, the goal for data collection was to interview between twenty and thirty guides. Of the twenty-two respondents, nine were working as snowmobile guides, ten were snowcoach guides and three were working as both. Six of the guides interviewed were female and the rest were male. The respondents represented a wide range of companies operating within the park. Most were from West Yellowstone but several were from companies operating out of Mammoth and Jackson, Wyoming.

The analysis procedures developed for the interviews were conducted with NVivo, a qualitative data organizing system. The interviews were tape recorded and then transcribed and imported into the software. The purpose of organizing the data was to develop themes that

emerged from the interview process. The data were organized in the following manner to provide for meaningful analysis. First, responses were divided into the three major topics of clean and quiet technology, guiding requirements, and group size limitations. Within these, the responses were further categorized for each topic into three sub topics; visitor experiences, client comments and impacts on wildlife. In addition, responses were also divided by those guides who were working in the park before the requirement and those who were not. The analysis procedures also involved dividing the responses by type of guide (snowmobile, snowcoach or both). After developing the categories for analysis, the responses were interpreted in order to look for themes that emerged within and across categories. This was an iterative process of reading and re-reading interviews looking for commonalities within and between categories as well as reading for incipient themes that were underlying the responses. An example of an incipient theme is the guide's philosophy of what values should be represented in the park. Although the data analysis and collection procedures follow a systematic and rigorous process, the method does have limitations.

Although the data are useful because they provided in-depth and rich descriptions, data such as these are not easily generalized from individual cases to larger populations. However, in this case, we are interested in exploring the experiences of guides with reference to winter-use policies. Thus, the goal is to present a wide array of experiences and opinions on the efficacy of winter-use policies. Also, it must be noted that the guides' perceptions of the policy effectiveness only represent a partial perspective on the efficacy of winter-use policies. For a more complete perspective, it would be ideal to interview other stakeholder groups such as visitors and local residents. However, those interviews are beyond the limited scope of this study. The next section of this paper will present the results of the analysis procedures explained

above and will elucidate certain themes uncovered in the process of organizing and reading the data.

5.3 Results

The presentation of the results of the study will focus on the three main categories of the winter-use policies: clean and quiet technology, the guiding requirement and group size limits. Within each of these categories, themes related to visitor experiences, impacts on wildlife, and client comments will be explored. In addition, the coding and analysis procedures provided for the development of some general themes that cross categorical boundaries and illustrate the interconnectedness and complexity of guides' perspectives on winter-use policies. Whenever necessary, comparison between snowmobile and snowcoach guides and snowmobilers and snowcoach riders were made as some differences in perceptions between groups were uncovered. Also, guides were asked to comment on their views of changes in the type of visitor to the park and those results will also be presented. Finally, the suggestions for park management as given by the guides will be discussed in order to illustrate the major issues that guides have with the current policies.

Overall, the guides interviewed had a positive attitude towards the current winter use policies, and those who guided in the park prior to the implementation of the current policies found the visitor experience and condition of the park to be much improved. The following quote provides a good representation of many of the guides' perspectives on the overall efficacy of the current winter-use policies:

"I think overall, from what I've seen, the regulations are pretty good. You know, you hear talk both ways about limiting the use or maybe deregulating it a little bit, some of the different operating plans that were on the table last year that we got to view. And it seems like what we've got now seems to be a pretty good system. You know, you've got enough use that people are going to come in and see what it is that they're investing in, in a national

park. My fear would be that if it were limited more, then people couldn't see what it is they're protecting, the Park Service would suffer because of that" (r-19).

5.3.1 How Do Guides Perceive the Clean and Quiet Technology Policy?

With regards to the changes brought about through the implementation of clean and quiet technology, the guides were unanimous in the opinion that things are now better than they were before the regulations. The themes here focus on the park now being a cleaner and quieter place and that it is an improvement from past conditions.

"I think that ecologically it makes a lot of sense. The air quality is better, the sound pollution has been reduced significantly, and so from the ecological perspective, I think it's an improvement. I think it also is an improvement from what people are doing here" (r-07).

"For the better, way better. Like I say, I was going to quit, just because the driving in those conditions and trying to show the beauty of Yellowstone while you're in a road race, the noise, the smoke, the visual of them, and then to see them chase elk down the road, and so it was lawless" (r-16).

Guides also commented that the visitor experience has been enhanced through the use of clean and quiet technology. Several commented that there is not a place in the park for the two-stroke machines and that the visitors appreciate the quietness of the four-stroke machines as well as the reduction in pollution.

"Oh, that's a broad question. I think it's an overall good experience. You know, everybody seems to be pleased with the machines that we've gone to using. It's a good ride. They seem to enjoy themselves on the snowmobiles. And people who have ridden two-strokes before are usually pretty surprised. Like oh, wow, these are so much quieter. It's kind of nice. It still lends to kind of a serene experience in the park instead of the chaos that you get some places" (r-19).

"Much better. I think people can appreciate the, you know, without the sound of all those high-tuned machines and the smoke, and the lesser crowds. And also something that people don't talk about is the road conditions, the moguls... So it's much smoother and quieter and better-smelling" (r-16).

"There's no need to have the two-strokes in here so I don't think it's, it's not made it worse by any means. But I think it's definitely changed it because we can hear each other over snowmobiles and the soundscape is there, so" (r-14).

The guides reported that their clients did not comment as much on the clean and quiet technology unless they had been in the park prior to the new policies or have ridden two-stroke snowmobiles

on their own. One theme introduced here and repeated across categories is that of the 'unknowing' or uninformed client who comes into the park for a winter experience not knowing the context in which the current policies developed.

"You know, there's so many that don't know the difference, that haven't been in before in the wintertime. But the ones that were in prior, they seem to; my people have had a positive response to it" (r-02)

"Most of them are new clients, and so we don't have that many, we have a few returning clients and those are the ones that have noticed. But as far as like the newer clients go, it's, they just seem to be against them (snowmobiles) altogether. They don't understand what it used to be like, for one thing" (r-08).

"They do from time to time. It is a noticeable thing for a lot of the, especially a lot of return visitors that have seen it the way it used to be. And they're seeing it nowadays with the cleaner, quieter machines. And they feel it's a better experience for them" (r-21).

One snowmobile guide made an interesting comment that some of the visitors that ride four-stroke snowmobiles in the park then request those machines when they ride in the National Forests. This is significant because it suggests there might be a diffusion of cleaner and quieter machines outside the park due in large part to the positive experiences visitors have had with cleaner, quieter snowmobiles inside the park.

"They do, they, you know, we also do a lot of trips in the forest where two-stroke machines are still just fine. And maybe a client comes and does a trip up here and then goes to the forest. And they're like, wow, those machines in the park are really quiet and I like having them not smell. Even some people go so far as they prefer, they ask for a four-stroke machine outside of the park, you know, because they don't like all the emissions and stuff like that" (r-20).

The guides showed mixed comments on the impacts on wildlife of clean and quiet technology. Some commented that there was a difference in how the wildlife reacts to two-stroke machines versus the four-stroke machines used in the park. The issue of effects on wildlife drew mixed comments across categories. Some guides perceived the new regulations to be beneficial to wildlife and some thought that there was no difference, particularly because the animals were habituated to vehicles on the road. Other guides simply refused to comment, mostly citing that they did not have enough information to speak about effects on wildlife.

"Not having been here before, it's hard to know exactly what the difference is. But from my experience with the machines, being a little bit quieter, as far as like wildlife is concerned, the bison here in the park and that sort of thing, tend to not respond to us a whole lot. If we're riding the two-strokes outside of the park and we encounter wildlife, they usually seem a little more skittish about our machines" (r-19).

One snowmobile guide made an interesting observation that the animals had to get used to the quieter snowmobiles after being exposed to years of louder, two-stroke snowmobiles. While this is anecdotal, it is significant because it suggests that the transition to clean and quiet technology might have required wildlife to make some changes in how they sensed vehicles.

"It has. The first winter was a little scary at first, with all four-strokes, because animals didn't hear us coming. Yeah, and so we noticed that the bison were really on edge if we were on the road. We'd have to get right up on them before they'd notice that we were there and it would spook them. And so I think they're used to us now, but they were used to being able to hear somebody coming from a mile away, and now they can't do that, so they had to kind of change their senses" (r-14).

Still, other guides were not sure of the impacts of clean and quiet technology on wildlife, and for others there was no real difference because the wildlife in the park have been habituated to the presence of vehicles on the roads.

"I don't know how I could ever judge or evaluate that. There's so many other things that have affected wildlife... I don't have an opinion. To be honest with you, I just don't. I've lived here for 32 years and it's still, I don't know whether the cleaner, quieter has done anything for the wildlife or not. That's as honest an answer as I can give you" (r-18).

Overall, the snowmobile and snowcoach guides were of the opinion that the implementation of clean and quiet technology was beneficial to the ecology, improved the soundscape and enhanced visitor experiences. Many of the snowmobile guides noticed that their clients who had not been in the park before were unaware of the context within which the current regulations have developed and thus simply accepted the rules. There was less agreement among guides about the effects on the wildlife. This lack of consensus on the effects of current policies on the wildlife is an ongoing theme that is repeated across categories.

5.3.2 How Do Guides Evaluate the Guiding Requirement?

The questions about the guiding requirement proved interesting to pose to the guides themselves because without this requirement, fewer guides would be employed in the park. With that said, there were a few guides who were opposed to the guiding requirement. Several themes emerged during the analysis of these sets of responses. First was the theme of education and interpretation. Most guides spoke of visitor experiences being enhanced because they were now getting an interpretive experience in the park during the winter, due mainly to the requirement of having guides. Another theme repeated, particularly by snowmobile guides was that part of the guides' role is to enforce the regulations of the park and ensure that the clients stay safe. Finally, and perhaps most significant is the set of comments made mostly by snowmobile guides that there seems to be a change in visitor characteristics since the guiding requirement was instituted. Some perceived this to be a change in clientele and others thought it to be a change in attitudes towards a more interpretive and less adventurous experience.

"Oh, I think it's much better for the visitors. I think it's better for their experience, for the expectations of the ones who come here who want to learn something about the park, and it also has put the kibosh on the ones who want to come here and cause problems. You can see that separation in West Yellowstone. The people who come here to race around and have noisy machines, they're going out in the national forest. They're not coming here in the park anymore. They don't want to rent these four-stroke engines because they don't have any performance, and that's fine. Let them go in the national forest. We don't want them in the park" (r-07)

The next quote proves to be particularly salient in describing the change in how people experience the park. It suggests that people are now coming into the park on snowmobiles to experience the park rather than using the park as another venue to ride their snowmobiles. The connotation is that there is now more appreciation among clients for the wildlife and natural features of the park. The following quote provides a well-articulated perception of the changes

occurring in park visitors due to the guiding requirement and the associated focus on education and interpretation and de-emphasis on having an adventure experience.

"For the better. You have more people that have more of an appreciation for the park. They can understand a little bit better what's going on, instead of just blasting down the road seeing how fast their snowmobile can do. It seemed like before that people were using Yellowstone to experience a snowmobile, not a snowmobile to experience Yellowstone. And now it seems to be people are actually benefiting more from the experience" (r-08).

The next set of quotes emphasizes the guides' focus on education and interpretation. Again, this theme is repeated across categories and suggests a major change in how visitors are experiencing the park. Most guides, snowmobile and snowcoach, talked of educating their clients and helping them appreciate the natural features and wildlife within the park.

"Well, we're hoping, I'm out of West Yellowstone and we have a guide association there. And what we're trying to do is advance the interpretive ability of the guides so we're not just drivers. We're not just people leading people through the park but we are interpreting what they see, explaining what's happening here in the winter" (r-02).

"Oh, I think it's better because they're more educated. I mean, even summertime visitors, so many of them, they just drive through the park. They don't really take the time to look at things and by having a guide, you know, you can educate them on the things that they're seeing and what they are seeing. Because, you know, I've had people, well, what is that? Well, it's an elk. They don't know the difference. If they were just cruising through the park, whether it be winter or summer, they might not even know what animal it is. So I think it's a better experience for the people. I really do" (r-02).

"I think that the people who come to the park who are getting qualified narrative and interpretive stuff are getting a better experience. But then the ones who want to come here to play would say you're full of you-know-what, and so you've got to ask the folks. My personal opinion is that the folks who come here who get a guided trip are going to get more out of it than the ones who just want to come here and race around and drink Bloody Mary's and raise hell and chase the buffalo" (r-07).

"I think it's awesome. Yeah. People are actually learning about the park. We've got hundreds of miles that they can ride outside the park if they want to just zip around, but they're actually experiencing Yellowstone instead of just flying by and out" (r-14).

Another theme that emerged from the responses to the questions about the guiding requirement was that of providing a safe experience and regulating visitor behavior to ensure that clients obeyed park regulations. This theme was evident in responses from both snowmobile and snowcoach guides.

"Yeah. Well, I would say that in the long run they have, that those people having guides has impacted my people in a positive way because they don't have to experience and participate in the bad behavior that was here in the old days" (r-07).

"It seems to be good. Most people really enjoy knowing that they're with somebody that knows what's going on. We have a good many guests that are kind of nervous about the wildlife situation and they seem to appreciate that. And I could really see where some guests would be tempted to, you know; get a little too friendly with the wildlife. So it seems like a good thing to kind of keep things under wraps and not have anybody do anything that could harm themselves or the wildlife" (r-19).

Finally, there were a few guides, snowmobile and snowcoach, who were not as positive about the guiding requirement. These guides felt that the guiding requirement inhibited people's freedom to enjoy the park on their own terms. However, even these guides seemed to be conflicted, realizing that for many visitors the guided experience enhanced their enjoyment of the park while acknowledging that some visitors were inhibited by the guiding requirement.

"I guess I'd make two comments, or at least two. Number one, I think it's unfortunate that people have to be accompanied by a guide to enjoy Yellowstone. That seems to be kind of an infringement on; I'm not going to say a basic right, but just an infringement on their freedom. We don't require that in the summertime, thank the Lord. Why do we require it in the wintertime? So, but I will say that I think overall that probably the people that are leaving Yellowstone because they came here in the winter with a guide; they've got some more knowledge than they would have had otherwise. So if the name of the game is to try to teach people about some of the things in Yellowstone, wildlife, their little features, etc., etc., the guide thing is accomplishing that. However, you know, do you need a guide just to view it all and appreciate it? Well, some people, I'll submit to, you know, they don't. We've got people in here right now that would just as soon be on their own" (r-18)

"I would say it is probably better for your average visitor to have a guide, because, you know, they're with an interpretive tour, interpretive tour guide who's giving them some good information that they may not have otherwise find out for themselves or not. I recall before the snowmobile regulations that a lot of people did like going out in the park on their own on their own snowmobiles so they could enjoy the sights at their own pace without an interpretive guide or they could get off their snowmobile and go for a ski or snowshoe trip, that kind of thing. So I think that's limiting some people nowadays" (r-21).

When asked about how their clients commented on the guiding requirement, there was a distinct difference in how snowmobile and snowcoach guides responded. Snowcoach guides generally did not receive many client comments on the guiding requirement primarily because the snowcoach experience is necessarily one that requires a guide. Conversely, the snowmobile experience did not previously require a guide and snowmobiles are more akin to cars, precipitating an individual experience while the snowcoaches are by default a group experience. These differences in how people experience the park via the mode of transport they choose are

evidenced in how the guides reported their clients' comments. The theme repeated here is one of a change in perspective of many snowmobile clients. Many snowmobile guides reported that they had clients who had a negative attitude at the beginning of the day but by the end of the day, most were appreciative that they had a guide, primarily due to the interpretation and education they received.

"Like I say, there's some people that are a little bit huffy, a little belligerent to begin with, and then by the end of the day, they prefer that they have a guide, you know, as opposed to not" (r-02).

"Yes, and it will change throughout the day. In the morning, they'll start out oh, I don't want a guide and oh, I've been doing this for 20 years. And by the time they get home, they're like wow, I learned so much more that I didn't even know existed" (r-14).

The other theme that emerged from the responses of the snowmobile guides is that of transferring the values of the park as a place to experience the landscape and wildlife as well as to have a learning experience in addition to having an adventure on their snowmobile. The guides emphasized in their comments that some clients who complained about having a guide did not share the same attitude of the park as a place for learning more than a place for adventure. The following set of quotes also illustrates the role of snowmobile guides in enforcing the regulations of the park.

"Most people seem to be okay with it except the ones that want to go off and play by themselves. And we just tell them, okay, take your day in the park and then go play in the national forest. And they're pretty much okay with that these days" (r-22).

"The only ones, I would say, that complain about having guides are the ones that would probably break the rules. I would say it's the ones that you have to stop and talk to" (r-12).

"Well, actually I've had comments both ways. People that have been in the park by themselves will be disgruntled about having to come with a guide, but they usually have a nice time anyways. And then from the other side of it too, like really glad that we have a guide so we're not getting into trouble or doing something that's dangerous, that kind of thing" (r-19).

In summary, the guides' comments on the guiding requirement were mostly positive. This was an expected outcome because many guides have jobs in the park because of the

requirement. However, the guides also expressed that their primary role was to provide an interpretive experience while keeping their clients safe. There were also guides who expressed some discontent with the guiding requirement, noting that for some visitors, the experience diminished their sense of freedom and ability to experience Yellowstone on their own terms. The next section explores guides' perceptions of the implementation of group size limits.

5.3.3 What is Guide Perception of Group Size Limits?

There were some distinct themes that emerged from the responses to the questions regarding the effects of group size limits. These limits necessarily affect snowmobile guides more than snowcoach guides because the regulation is focused on snowmobile trips and the snowcoaches are a self-contained experience, limited by the size of the vehicle. By and large, snowmobile guides expressed a preference towards smaller group size limits for two reasons. First, they commented that a smaller group was easier to control and second, smaller groups allowed for a more personal experience for visitors, allowing the guides to provide more effective interpretation. The following set of comments from snowmobile guides illustrates their range of opinions that smaller groups are easier to control.

"I would say it's a safer trip for us, and it's also controlled. They learn a lot more easier than when they used to just blow by you" (r-03).

"I think a lot of the guides would like to see less. They'd like to see seven sleds, you know, because it's so much easier to manage them when there's seven than it is . . . You can't turn around when you're going 40 miles an hour, or you can on a sled as a guide and look, but you can't see everybody, not on the S-turns and the Firehole. So I think they should probably not allow ten sleds. I think it should be a little smaller group. I think they'd have more fun. I think they'd learn more from it" (r-17).

"I think that's a good thing. As far as I'm concerned as a guide, a bigger group than what we have is mass chaos. If you get ten sleds behind one guide, which is our limit, it's already really touchy sometimes trying to keep everybody organized and safe and everything. So I think it's good" (r-19).

Snowmobile guides also commented that they can give a better interpretive experience to smaller groups and their clients get more personal attention.

"I don't think it really makes that much difference. I think that smaller is better because I think you can give a more quality trip to the people. For example, if we have 40 people out here, how can you manage, talk and educate the people" (r-02).

"Well, like I said before, the smaller the group, the more one-on-one you get with the guide, the more questions you can ask, the better interpretation you get" (r-05).

Finally, the snowcoach guides did not have the same perspective on group size limits because the regulation does not directly affect their operations. However, there were some guides that commented on how having smaller groups did indirectly affect their clients' experience. The following quote illustrates how smaller groups of snowmobiles allows snowcoach drivers to gauge more easily their ability to drive their coach through groups of snowmobiles. It also illuminates the view of some snowcoach drivers that a smaller snowcoach provides a more personal experience for their clients. In addition, the final sentence brings up an important point that owners of the guiding companies want to maximize the numbers of people in the coaches in order to increase profits and that the guides are not necessarily in agreement with that perspective.

"I've got to say that's got to be better. But since I've never actually ridden a snowmobile in Yellowstone, I don't know for sure. I know it's easier on a snow coach driver knowing there can only be that many sleds before you finally get your chance to go, as we've got to wait for them all to move through before we can, because we're too slow to pull in front of them. In my opinion, the smaller the group size the better the tour. So in my case, the smaller the van, the better. My bosses don't agree with that, but I do" (r-22).

With regard to client comments on group size limits, most guides said that their clients did not say anything specifically about the regulation. However, a few snowmobile guides did respond that their clients did comment on group sizes. These comments focused on the idea that clients who wanted a smaller group would just pay for a private tour. Also, a few snowmobile guides commented that their clients said that they would not want a bigger group, primarily due to safety concerns.

"For the most part, no. People that want a smaller group, they'll pay to have a private tour. But as far as, we've never had groups that were so big. I mean, we've had groups of 20 or something, but we'll have two guides and they understand, and it helps to kind of wrangle them" (r-14).

"Yeah. I've had a lot of clients, especially in the bigger groups; say if it was much bigger than this, we wouldn't want to come. We'd be worried about getting left behind on the trail or this or that, and some of them have even had experiences in other places where that's happened to them. So everybody seems to be pretty pleased with that" (r-19).

When asked about the effects of group size limits on wildlife, again, the responses were mixed with most guides not seeing how group size limits would affect wildlife specifically. The major reason cited by guides was that even though group sizes are limited, there are many groups in the same area thereby negating the effect of smaller groups, particularly in areas where groups stop to view wildlife.

"I'm not seeing where the size would matter" (r-06).

"I don't think it's really changed it. You know, on busy days, when we're running altogether, they're doing the same thing as when I've got two clients with me" (r-14).

The next section focuses on the guides' perceptions of whether or not there is a different type of client in the park now than there was before the current regulations. Again, there was a range of responses, reflecting the individual experiences of the guides.

5.3.4 Do Guides Perceive There to be a Different Type of Client?

Guides who worked in the park prior to the current winter-use policies were asked whether or not there was a different type of client in the park now with the new regulations. The responses were mixed with some guides saying that the clientele was basically the same while other guides thought there was a change in the clients who were now coming into the park in the winter. Again, the theme here was one of education and experiencing the natural beauty of the park, rather than using the park to experience a snowmobile. Many of the responses also reflect

the guides' opinions that the park is a place for experiencing nature, first and foremost. In addition, many of the guides' responses illuminate that there is a range of experiences for visitors in the region due to the other public lands surrounding the park and that people can have an adventure experience on a snowmobile outside the park and then come into the park to enjoy nature and be educated.

"Somewhat. But in general, it's the same people coming. They're coming here because somehow they've realized or read or had somebody tell them about the winter experience here. And I think for the most part in this country and around the world, people don't realize it's open in the winter" (r-01).

"We don't. We still have people looking for nature, going skiing, snowshoeing, photography. Definitely a little different, you don't get the hot-rodders in here and so that clientele has changed. And there's all that country outside of the park to ride for those kind of people, but they all seemed to spend at least one day in here in the old days. It seems like, you know" (r-16).

"You see more people that are more interested in what the park is like, and the wildlife, and the geysers, and the majority of the snowmobilers you'll talk to now, you know, they've also had a cross-country skiing experience in the park" (r-08).

The following quote from a snowmobile guide provides an insightful commentary on the range of visitors who are experiencing the park as well as the range of activities available for visitors to the region. The quote also provides insight to why the clientele might be changing due to the new regulations. Specifically, the guide mentions that people coming to have an adventure on their snowmobile are also coming into the park for a guided experience and that others, not wanting to spend the money, are avoiding the park altogether.

"We still get our fair share of sled-necks, people who bring up their own sleds. And they spend three or four days or a week outside the park, and they come in the park once or twice. But I would say yeah, I think the guests have changed because there are a lot [inaudible] 10:34 that will pay the money to come in the park that, because they have their own sleds and they don't want to spend $150 to have to rent a four-stroke sled to come to the park with a guide. So I think our clientele has changed a little bit. We've gotten more of the, I think we've got more of your kind of nature lovers and fewer of your people that just want to go tear through the park, because they know that with a guide they're not going to be able to do what they used to do" (r-12).

The previous quote points out the complexity of the winter visitor experience in the park. This complexity is due in part to the interaction of winter use regulations, the availability of a

range of visitor experiences and the regional resources available for recreation on public lands. Such complexity is evidenced in the variation in guides' perceptions of the change in clientele within the park. Snowmobile guides in particular are privy to the range of experiences and scope of recreation resources available as many guide both in the park and in nearby National Forests. Their perspective is broader than that of snowcoach drivers who are mostly of the opinion that their clients are generally the same. The next section discusses the guides' suggestions for park management as to the current winter use policies and how they could be improved.

5.3.5 What Suggestions do Guides Have for Managers?

The guides were asked at the end of the interview if they had any suggestions for park management regarding the winter-use policies now in place in Yellowstone. Overall, the responses were that there were no major problems and that generally, the plan is working out well. Many guides had no suggestions and instead commented on how they liked the current policies. Other guides however had a range of specific suggestions on how management could improve the situation in Yellowstone in the winter. There were some distinct differences between snowmobile and snowcoach guides. In particular, snowmobile guides were concerned about road conditions and the enforcement of the 1/3 mile rule. The following quotes illustrate the variety of responses and are also representative of the positive attitude that all of the guides interviewed for this study had towards the current policies. The first two quotes below give the differing opinions of snowcoach drivers towards the presence of snowmobiles in the park. It must be noted here that the second respondent advocating the removal of snowmobiles was the only guide interviewed recommending such a course of action. Most of the snowcoach guides shared opinions of snowmobiles more akin to that expressed in the first quote below.

"Well, I would like to see, I'm a snowcoach only guide. I would like to see that they continue to allow snowmobiles in here, too, because I think it's good to have some choice. I don't think they need to ratchet down the number of people any more than they have. I think they've done fine with this winter use plan where we have a combination of styles going in the park here. This country is all above having choice and I would like to see snowmobiles continue to be allowed in here" (r-01).

"I think they should pursue them. Ultimately, I'd like to see snowmobiles removed from the park totally. There shouldn't be any snowmobile access in the park, in my view. It should be all snowcoaches and, as far as the number of snowcoaches, who knows. No studies have been done on what kind of impact snowcoaches have, but this all goes back to the whole idea of how many vehicles is appropriate, and when you're talking about what's appropriate and what time of year, and what are you talking, wildlife, people, whatever, I don't know. But I'd like to see those things out of here. I just don't think that they belong here" (r-07).

The next comment is of interest because it illuminates one guides' philosophical view as to why winter –use should be continued in the park. He gives the opinion that the impact of visitors in the winter is offset by the effects of their experiencing the park to transform them into advocates.

"I think we've got a pretty common sense, middle-of-the-road compromise and it works for the majority of the American public. I mean, certainly there's some people out there that think we should have rampant use of snowmobiles, and there's some other people that think we shouldn't have any. And we've reached a common sense middle ground. Because obviously, you know, we do have visitors in here in the winter. Because otherwise, you know, this is the way I look at it. If you've got to have advocates, you can't have anybody advocating to protect the park. And the only way you're going to have advocates is to have people come in and see how beautiful it is. So that, I think, balances out the minimal amount of impact that I see" (r-05).

The next two comments from snowmobile guides address the topic of law enforcement in the park and that the current combination of ten snowmobiles to one guide and the 1/3 of a mile limit is seen as difficult to maintain in certain conditions. The second comment in particular states that ten snowmobiles in a group is too many to effectively control and that once the group sizes are reduced, the situation might be alleviated.

"You know, it's hard for the law enforcement officers, the LE guys to, I think the guiding alone, making them have guides alone, has cut down on the amount of law enforcement that they have to do or they have to enforce. I think that's the best step that they could have done. But as far as suggestions, you know, I think they need to be a little lenient on some of these guys. Handing out a $250 fine to somebody because he didn't keep his sleds in an organized manageable group is bullshit" (r-17).

"Well, I do think that snowmobiles, I think that ten is too many. Because personally, I mean, I've heard from other folks and having ten snowmobiles behind me, they, you know, most of the snowmobile guides will tell you that they can't keep an eye on the ten snowmobiles behind them. You know, and there's been many this winter so far that have gotten tickets because they're, you know, because they're supposed to be a third of a mile behind the guides. So I think that if they move the numbers lower after that that would probably help a little bit" (r-13).

The final comment is one that was echoed by a handful of guides, snowmobile and snowcoach and it addresses the issue of requiring guiding in the park. This issue might be particularly sensitive for the guides because many are local and they are all professionals operating within the park. Therefore, the guiding requirement, as expressed by these individuals in the interviews is limiting the ability of some people to experience the park on their own terms. Also, several guides expressed concern that the cost of hiring a guide to come into the park was prohibitive, particularly for some locals.

"I would like, there is one thing, I would like there to somehow be a way that individuals could come in here without a guide. I want to bring my grandson in here. I can't do that. It's not like, and I'll personalize it. Gosh dang it, I've been here for 32 years, almost 32 years. You're telling me that I don't have it figured out as to what I should and shouldn't do and that I can't pass that along to my grandson, that I've got to hire somebody to do that. I wish there was some way that that could be accomplished. And I don't know how. I wish I could, I'd offer it to you, but I don't. And I'm not trying to set myself up as the exception to the rule. Hell, everybody's the exception to the rule. I'm a good guy. Well, is there some way that those "good guys" could do their thing" (r-18).

This section of guides' suggestions for managers highlights a few important issues. First, the guides are overwhelmingly in favor of the policies in the park as they are now. A few expressed concerns with the ratcheting down of the numbers of snowmobiles and others expressed concern about the requirement of having to enter the park with a guide. The requirement of having a guide in the park has perhaps the most serious implications. This is because some local people who feel they are somehow qualified to enter the park without a guide are not allowed to do so, even if they want to experience Yellowstone in the winter but cannot afford a guide. While these people probably represent a small population it is still worth noting that they feel excluded from the park based on their ability to pay for a guide.

5.3.6 Discussion

There are several themes that cross categories and deserve some further discussion here. These themes are somewhat interrelated and overlap a bit. These are the focus of the guides in

general on providing an educational and interpretive experience, the values of the guides themselves regarding Yellowstone and the changes in client attitudes. In many ways, these themes are consistent with the literature on guides and guiding.

The idea of the guide as a mentor, one who is focused on transmitting and interpreting information is reflected in many of the comments of the guides interviewed during the course of this research. The guides themselves were interested in learning about the park and enhancing visitors' experiences by attaching meaning to what they were seeing through interpretation and education. In this way, the guide's role as an interpreter is then one of communicating information in such a way as to produce a visitor who is mindful of the destination, willing to learn and broaden their perspective by understanding Yellowstone and its unique landscape. As a wilderness servicescape, Yellowstone has service providers such as snowmobile and snowcoach guides who are charged with the responsibility of ensuring that visitors' impacts on the environment are minimized first, even at the expense of visitors' needs and wants. As such, guides are communicating the conservation values held within Yellowstone to their clients, exerting influence on how their clients interpret their own experiences. Therefore, the guides, some consciously, are conveying ideas of preservation of the park to their clients. The result of this could be a reshaping of visitor attitudes towards environmental protection and encouraging environmentally responsible behavior. The discussion of changes in client attitudes is particularly salient here as many snowmobile and even a few snowcoach guides noted that a good portion of visitors who started out the day thinking they did not need a guide were, at the end of the day, appreciative of what they learned about the park. Also of relevance is the possibility that the people attracted to having a winter-visitor experience in Yellowstone are those who share the same environmental values as are portrayed through park policies. These

issues are, however, speculative and would require further research in order to determine if the anecdotal information by the guides does in fact coincide with what the visitor is experiencing.

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7 APPENDIX A: SURVEY INSTRUMENTS AND OMB CLEARANCE

SOUNDSCAPE SURVEY

Introductory Script for Soundscape Survey

Hello. I am _____ (name) and am working for the University of Montana in cooperation with Yellowstone National Park. We are doing a survey of visitors stopping at Old Faithful Geyser and Snow Lodge. Would you be willing to answer some questions?

The Paperwork Reduction Act requires approval of all federal government surveys by the Office of Management and Budget. This survey has been approved under this Act. The Office of Management and Budget control number and expiration date is available at your request. Additional information about this survey and its approval is available at your request.* The questions on this survey will take about **15 minutes** to complete. All of your answers are voluntary and anonymous.

Thank you.

***Additional Information Provided upon Request.**

OMB Approval number: 1024-0256

Expiration Date: January 31, 2009

Person Collecting and Analyzing Information: *Dr. Wayne Freimund*

Department of Society and Conservation

College of Forestry and Conservation

University of Montana

Missoula, MT 59812

(406) 243-5184

16 U.S.C. 1a-7 authorizes collection of this information. This information will be used by park managers to better serve the public. Response to this request is voluntary and anonymous. No action may be taken against you for refusing to supply the information requested. No personal data will be recorded.

You may direct comments on the number of minutes required to respond, or on any other aspect of this survey to:

John Sacklin

Yellowstone National Park

307-344-2020

John_Sacklin@nps.gov

About Your Trip

1. What type of group were you with on the trip when you were interviewed? (check all that apply).

- ☐ alone
- ☐ family
- ☐ friends
- ☐ outfitter/guide group
- ☐ organization or club (name of organization/club)_____

2. During your visit to the Yellowstone area, how many days will you recreate within Yellowstone National Park? _____

3. Will you engage in the following activities during your visit to Yellowstone National Park? (please circle yes or no for each activity)

a. snowmobiling	YES	NO
b. cross-country skiing	YES	NO
c. snowshoeing	YES	NO
d. snowcoach touring	YES	NO

4. Which of the following best describes your <u>primary</u> activity while in Yellowstone national Park?

- ☐ cross-country skiing
- ☐ snowshoeing
- ☐ snowmobiling

□ other: _____

5. While on your trip to the Yellowstone area, please state the number of days you will also do the following activities in other areas (such as nearby National Forest lands or National Parks)? If none, please put "0" (zero):

Activity	Number of days
snowmobile	_____
cross-country ski _____	
down-hill ski	_____
snowshoe	_____

Role of Yellowstone National Park

6. We are interested in your opinions about the value of Yellowstone. Please indicate for each of the following, how much you agree or disagree that they are important to the overall value of Yellowstone National Park (1 being strongly disagree, and 5 being strongly agree):

Yellowstone National Park is particularly important as:	Strongly Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Strongly Agree	Don't Know
a wildlife sanctuary	1	2	3	4	5	DK
a place for education about nature	1	2	3	4	5	DK
a place to develop my skills and abilities	1	2	3	4	5	DK
a place for natural quiet	1	2	3	4	5	DK
a protector of threatened and endangered species	1	2	3	4	5	DK
a sacred place	1	2	3	4	5	DK
an economic resource	1	2	3	4	5	DK
a family or individual tradition	1	2	3	4	5	DK
a place free of motorized noise	1	2	3	4	5	DK
a place everyone should see at least once in their lives	1	2	3	4	5	DK

a place without most types of commercial development	1	2	3	4	5	DK
a display of natural curiosities	1	2	3	4	5	DK
an historical resource	1	2	3	4	5	DK
a symbol of America's identity	1	2	3	4	5	DK
a place for the use and enjoyment of the people	1	2	3	4	5	DK
a social place	1	2	3	4	5	DK
a site to renew your sense of personal well-being	1	2	3	4	5	DK
a place of scenic beauty	1	2	3	4	5	DK
a place to be free from society and its regulations	1	2	3	4	5	DK
a reserve of natural resources for future use	1	2	3	4	5	DK
a place to hear natural sounds	1	2	3	4	5	DK
a tourist destination	1	2	3	4	5	DK
a place for scientific research and monitoring	1	2	3	4	5	DK
a place for recreational activities	1	2	3	4	5	DK
a place for wildness	1	2	3	4	5	DK
a place for all living things to exist	1	2	3	4	5	DK

a quiet place	1	2	3	4	5	DK
a protected place for fish and wildlife habitat	1	2	3	4	5	DK

Natural Sounds and Your Experience of Yellowstone National Park

Natural sounds **include natural quiet and all sounds that occur in the park and are produced by animals, weather, and other natural park features.**

7. Please rate how important the opportunity to experience natural sounds in Yellowstone National Park is to the overall value of the park:

- ☐ Extremely Important
- ☐ Very Important
- ☐ Moderately Important
- ☐ Slightly Important
- ☐ Not at all important

8. Please rate how important it is to your experience today to have the opportunity to experience natural sounds in Yellowstone National Park:

- ☐ Extremely Important
- ☐ Very Important
- ☐ Moderately Important
- ☐ Slightly Important
- ☐ Not at all important

9. Please rate how natural sounds affected your visit to Yellowstone National Park:

- ☐ They had a positive effect
- ☐ They had no effect
- ☐ They had a negative effect

10. To what extent were you able to find the experience of natural sounds that you were looking for in Yellowstone National Park? (Check one only.)

- ☐ All of the time
- ☐ More than half of the time
- ☐ About half of the time
- ☐ Less than half of the time
- ☐ I was unable to find the experience of natural sounds I was looking for.
- ☐ I was not looking for any experience of natural sounds.

11. How satisfied are you with your experience of the park's natural sounds?

- ☐ Very satisfied
- ☐ Somewhat satisfied
- ☐ Neither
- ☐ Somewhat dissatisfied
- ☐ Very dissatisfied

12. How satisfied are you with your overall experience of Yellowstone National Park?

- ☐ Very satisfied
- ☐ Somewhat satisfied
- ☐ Neither
- ☐ Somewhat dissatisfied
- ☐ Very dissatisfied

13. For each of the word pairs below, please check the box that best represents your impression of the winter setting at Yellowstone National Park.

	Very	Somewhat	Neither	Somewhat	Very	
Pristine	☐	☐	☐	☐	☐	Polluted
Loud	☐	☐	☐	☐	☐	Quiet
Appropriate	☐	☐	☐	☐	☐	Inappropriate
Acceptable	☐	☐	☐	☐	☐	Unacceptable
Dissatisfying	☐	☐	☐	☐	☐	Satisfying

Support for Potential Management Actions

14. We are interested in your willingness to support the following *management actions to protect opportunities to experience natural sounds*. Please indicate for each of the following management actions the extent to which you support or oppose them.

Management Action:	Strongly Oppose	Somewhat Oppose	Neither Support nor Oppose	Somewhat Support	Strongly Support
Continue to require the best available technology (cleanest and quietest) for all snowmobiles entering the park	1	2	3	4	5
Continue to require all snowmobiles entering the park to be part of guided tours	1	2	3	4	5
Continue to limit the total number of snowmobiles entering the park per day	1	2	3	4	5
Continue to limit snowmobile group sizes to a maximum of 17 with two guides	1	2	3	4	5
Close roads to all oversnow vehicles (snowcoaches and snowmobiles)	1	2	3	4	5
Close roads to snowmobiles, and allow snowcoach tours	1	2	3	4	5
Plow all roads and allow automobile access to YNP in winter (no oversnow vehicles)	1	2	3	4	5

About You

15. What is your gender? (check one) □ Female □ Male

16. What is your age? _____

17. What is the highest level of education you have completed? (check one box)

- ❒ 8th grade or less
- ❒ Some high school
- ❒ High school graduate or GED
- ❒ Some college, business or trade school
- ❒ College graduate
- ❒ Some graduate school
- ❒ Master's, doctoral or professional degree

18. In which of the following kinds of places did you spend the most time while growing up (to age 18)? (check one box)

- ❒ On a farm or ranch
- ❒ Rural or small town [under 1,000 population]
- ❒ Town [1,000 - 5,000 population]
- ❒ Small city [5,000 - 50,000 population]
- ❒ Medium city [50,000 - 1 million population]
- ❒ Major city or metropolitan area [over 1 million population]

19. In what type of community do you now live? (check one box)

- ❒ On a farm or ranch
- ❒ Rural or small town [under 1,000 population]
- ❒ Town [1,000 - 5,000 population]
- ❒ Small city [5,000 - 50,000 population]
- ❒ Medium city [50,000 - 1 million population]
- ❒ Major city or metropolitan area [over 1 million population]

HUMAN-BISON INTERACTION SURVEY

Introductory Script for Bison Survey

Hello. I am _____ (name) and am working for the University of Montana in cooperation with Yellowstone National Park. We are doing a survey of visitors stopping at Old Faithful Geyser and Snow Lodge. Would you be willing to answer some questions?

The Paperwork Reduction Act requires approval of all federal government surveys by the Office of Management and Budget. This survey has been approved under this Act. The Office of Management and Budget control number and expiration date is available at your request. Additional information about this survey and its approval is available at your request.* The questions on this survey will take about **20 minutes** to complete. All of your answers are voluntary and anonymous.

Thank you.

***Additional Information Provided upon Request.**

OMB Approval number:	1024-0256
Expiration Date:	January 31, 2009
Person Collecting and Analyzing Information:	*Dr. Wayne Freimund* *Department of Society and Conservation* *College of Forestry and Conservation* *University of Montana* *Missoula, MT 59812* *(406) 243-5184*

16 U.S.C. 1a-7 authorizes collection of this information. This information will be used by park managers to better serve the public. Response to this request is voluntary and anonymous. No action may be taken against you for refusing to supply the information requested. No personal data will be recorded.

You may direct comments on the number of minutes required to respond, or on any other aspect of this survey to:

John Sacklin
Yellowstone National Park
307-344-2020
John_Sacklin@nps.gov

Human-Bison (Buffalo) Interaction Survey

[*Reviewers—please note: Questions #1-#7 will be conducted as an interview. The interviewer will ask the questions and record the answers. Question seven has two parts. First the interviewer will ask the participant to characterize the bison encounters they have had up to that point in the trip by using the list of bison responses in questions seven and checking all that apply. From this data, the interviewer will be able to discern whether the visitor perceived whether bison were altering their behavior due to the encounter. If the visitor identifies one of the last five encounter descriptors, the interviewer will ask the visitor to describe in detail an encounter that demonstrated that result. If the visitor did not check one of those descriptors, they will be asked to describe the interaction that had the greatest effect on their experience. While the respondent continues with the survey, the interviewer will ensure a detailed description of the encounter is recorded. Questions 8-12 will be referenced to the encounter described in question seven.*]

1. What type of group are you with on this trip? (check all that apply).

   - ☐ alone
   - ☐ family
   - ☐ friends
   - ☐ outfitter/guide group
   - ☐ organization or club (name of organization/club)_____

2. During your visit to the Yellowstone area, how many days will you recreate within Yellowstone National Park? _____

3. Will you engage in the following activities during your visit to Yellowstone National Park? (please circle yes or no for each activity**)**

a. snowmobiling	YES	NO
b. cross-country skiing	YES	NO
c. snowshoeing	YES	NO
d. snowcoach touring	YES	NO

4. Which of the following best describes your ***primary*** activity while in Yellowstone national Park?
   - ☐ cross-country skiing
   - ☐ snowcoach touring
   - ☐ snowshoeing
   - ☐ snowmobiling
   - ☐ other: _____

5 While on your trip to the Yellowstone area, will you also do the following activities in other areas (such as nearby National Forest lands or National Parks)?:

Activity	Number of days
snowmobile	_____
cross-country ski	_____
down-hill ski	_____
snowshoe	_____

About Bison Encounters

We are interested in visitors' experiences and observations watching bison (also known as buffalo) from oversnow vehicles. Please respond to the following questions about your experiences observing bison.

6. When traveling by snowcoach/snowmobile in the park today, did you see bison?
Yes ____ No ____

If yes, on how many different occasions: _____ [fill # of occasions]

[Instruction to interviewers: An occasion is defined as encountering either a lone bison or a group of bison in a specific location at a specific time. Encounters with single bison or groups of bison that are separated by both time and space represent different occasions.]

7. Which of the following best describes the bison's response to the presence of you and/or the other visitors during the time you watched them? (***check all that apply***).

- ❒ None, the bison did not seem to notice the humans/oversnow vehicles
- ❒ The bison appeared to look up or notice, but resumed their activity
- ❒ The bison appeared alarmed and vigilant
- ❒ The bison traveled apparently to get farther away from the humans/oversnow vehicles, but appeared unhurried
- ❒ It appeared that the bison's desired movement was blocked
- ❒ It appeared that the bison's movement was hurried by the encounter
- ❒ It appeared that the humans put the bison to flight (at some point the bison ran)
- ❒ It appeared that the bison were defensive and charged or seemed ready to charge humans/vehicles
- ❒ Other: _____

INTERVIEWER: ***If respondent saw bison only once***, please ask him/her to respond to the following questions (#8-#13) about that experience.

INTERVIEWER: If respondent indicates that they saw a significant response from bison (bottom six plus "other" category) above, please ask him/her respond to the following questions (#8-#13) based upon the experience in which **the bison _____ (most significant action)**

INTERVIEWER: If the respondent indicates that they saw more than one of the earlier choices, please respond to the following questions (#8-#13) based upon ***the interaction that had the greatest effect on their experience.***

8. What made this experience the one that stands out in your mind?

INTERVIEWER: If respondent checked more than one answer in #7:

8. Which one of the bison reactions you checked had the greatest effect on your experience?

8a. What made this experience one that stands out in your mind?

Please answer Questions #9 through #13 for the bison encounter you listed in #8.
End of interview, visitor completes the following questions (#9-#24)

About Your Bison Encounter

9. Where were the bison when you saw them? (***Please check only one***).
   - ❒ At least some bison were on the road
   - ❒ At least some bison were within 10 ft of the road, but none were on the road
   - ❒ At least some bison were more than 10 ft from road, but still within 100 yards
   - ❒ All the bison were more than 100 yards from the road

10. Which of the following best describes what most of the bison were doing when you first saw them? (***Please check only one***).
   - ❒ Don't remember
   - ❒ Walking
   - ❒ Feeding/drinking/plowing snow aside to get to forage
   - ❒ Laying down
   - ❒ Interacting with each other
   - ❒ Interacting with other wildlife
   - ❒ Interacting with people
   - ❒ Other:_____

11. What sorts of responses did you see among humans (including your group and other groups) in relation to the bison? (***Please check all that apply***).

   - o Stopped, but remained on/in snowmobile/snowcoach
   - o Dismounted snowmobile/exited snowcoach, but remained near vehicle
   - o Approached bison to get a better look or better picture
   - o Snowmobiles/snowcoaches weaved through/around bison on road to get past them
   - o A snowmobile/snowcoach hit a bison
   - o Other: _____

12. For each of the word pairs below, please check the box that best represents your impression of the bison during the experience you describe above.

	Very	Somewhat	Neither	Somewhat	Very	
Healthy	☐	☐	☐	☐	☐	Unhealthy
Agitated	☐	☐	☐	☐	☐	Calm
Active	☐	☐	☐	☐	☐	Inactive

13. For each of the word pairs below, please check the box that best represents your impression of the interaction between bison and visitors described above.

	Very	Somewhat	Neither	Somewhat	Very	
Appropriate	☐	☐	☐	☐	☐	Inappropriate
Bad	☐	☐	☐	☐	☐	Good
Well Managed	☐	☐	☐	☐	☐	Poorly Managed

Acceptable	☐	☐	☐	☐	☐	Unacceptable

Questions about Overall Experiences

The questions below apply to your overall experience viewing bison during your trip to the park.

14a. Please rate the importance of each of the following aspects of bison viewing/management.

	Not at all Important	Slightly Important	Moderately Important	Very Important	Extremely Important
Opportunity to view bison	☐	☐	☐	☐	☐
Number of bison seen	☐	☐	☐	☐	☐
Proximity of bison to you	☐	☐	☐	☐	☐
Contribution of the guide to the bison viewing experience	☐	☐	☐	☐	☐
Guide's role in managing the visitor-bison interactions	☐	☐	☐	☐	☐
NPS management of visitor-bison interactions	☐	☐	☐	☐	☐
Role of NPS in brucellosis control/eradication in YNP bison	☐	☐	☐	☐	☐

14 b. Please indicate how satisfied you were with each feature during your bison experience at Yellowstone National Park today.

	Very Dissatisfied	Somewhat Dissatisfied	Neither	Somewhat Satisfied	Very Satisfied	Don't Know
Opportunity to view bison	☐	☐	☐	☐	☐	DK
Number of bison seen	☐	☐	☐	☐	☐	DK
Proximity of bison to you	☐	☐	☐	☐	☐	DK
Contribution of the guide to the bison viewing experience	☐	☐	☐	☐	☐	DK
Guide's role in managing the visitor-bison interactions	☐	☐	☐	☐	☐	DK
NPS management of visitor-bison interactions	☐	☐	☐	☐	☐	DK
Role of NPS in brucellosis control/eradication in YNP bison	☐	☐	☐	☐	☐	DK

15. For each of the word pairs below, please check the box that best describes the bison at YNP.

	Very	Somewhat	Neither	Somewhat	Very	
Wild	☐	☐	☐	☐	☐	Tame
Restricted	☐	☐	☐	☐	☐	Free
Dangerous	☐	☐	☐	☐	☐	Safe
Authentic	☐	☐	☐	☐	☐	Artificial
Stressed	☐	☐	☐	☐	☐	Peaceful
Entertaining	☐	☐	☐	☐	☐	Boring
Passive	☐	☐	☐	☐	☐	Active

Beliefs about Bison

16. Below are statements that represent a variety of ways people feel about bison and Yellowstone National Park. Please indicate the extent to which you disagree or agree with each statement: (*Check one box for each statement.)*

	Strongly Disagree	Moderately Disagree	Neither	Moderately Agree	Strongly Agree
Bison are given too much prominence in park planning.	☐	☐	☐	☐	☐
It is important that bison be respected as wild creatures in Yellowstone.	☐	☐	☐	☐	☐
Whether or not I would get to see bison, it is important to me that they exist in Yellowstone.	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
I feel a strong emotional bond to bison.	☐	☐	☐	☐	☐
Bison are an important part of American identity.	☐	☐	☐	☐	☐
It is important that Yellowstone always have an abundant bison population.	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
Bison have spiritual importance to me.	☐	☐	☐	☐	☐
Bison are an important part of Native American heritage	☐	☐	☐	☐	☐
It is important to maintain bison populations in Yellowstone so future generations can enjoy them.	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
Bison should be managed so as to remain wild in Yellowstone.	☐	☐	☐	☐	☐
If we did not have bison in Yellowstone, we would lose an important part of our cultural heritage.	☐	☐	☐	☐	☐
Visitor access should take priority over the protection of bison.	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
It is important to me to know that there are healthy populations of bison in Yellowstone.	☐	☐	☐	☐	☐
Bison deserve protection, but snowmobiles/snowcoaches do not seem to bother them.	☐	☐	☐	☐	☐

17. For each of the word pairs below, please check the box that best represents your impression of the winter setting at Yellowstone National Park.

	Very	Somewhat	Neither	Somewhat	Very	
Pristine	☐	☐	☐	☐	☐	Polluted
Loud	☐	☐	☐	☐	☐	Quiet
Appropriate	☐	☐	☐	☐	☐	Inappropriate
Acceptable	☐	☐	☐	☐	☐	Unacceptable
Dissatisfying	☐	☐	☐	☐	☐	Satisfying

About You

18. What is your gender? (check one) ☐ Female ☐ Male

19. What is your age? _____

20. What is the highest level of education you have completed? (check one box)

- ❒ 8th grade or less
- ❒ Some high school
- ❒ High school graduate or GED
- ❒ Some college, business or trade school
- ❒ College graduate
- ❒ Some graduate school
- ❒ Master's, doctoral or professional degree

21. In which of the following kinds of places did you spend the most time while growing up (to age 18)? (check one box)

- ❒ On a farm or ranch
- ❒ Rural or small town [under 1,000 population]
- ❒ Town [1,000 - 5,000 population]
- ❒ Small city [5,000 - 50,000 population]
- ❒ Medium city [50,000 - 1 million population]
- ❒ Major city or metropolitan area [over 1 million population]

22. In what type of community do you now live? (check one box)

- ❒ On a farm or ranch
- ❒ Rural or small town [under 1,000 population]
- ❒ Town [1,000 - 5,000 population]
- ❒ Small city [5,000 - 50,000 population]
- ❒ Medium city [50,000 - 1 million population]
- ❒ Major city or metropolitan area [over 1 million population]

23. What is your approximate total household income before taxes? (check one box)

□ Under $ 10,000	□$ 60,000 - $ 69,999
□ $ 10,000 - $ 19,999	□$ 70,000 - $ 79,999
□ $ 20,000 - $ 29,999	□$ 80,000 - $ 89,999
□ $ 30,000 - $ 39,999	□$ 90,000 - $ 99,999
□ $ 40,000 - $ 49,999	□ $100,000 - $199,999
□ $ 50,000 - $ 59,999	□ $200,000 or more

Guide Study Interview Guide

1. How long have you been guiding during the winter?
2. Do you guide with only snowmobile or snowcoach? Or both?
3. How would you characterize the general visitor experience here in the park now that clean and quiet
technology is required?
a. If you guided in the park before the requirement, have the changes been for better
or worse?
4. Have your clients commented on the impact on clean-quite technology?
a. If so, how do you think it has impacted their experience?
b. Do you think it has changed conditions for wildlife in the park?
5. How would you characterize the general visitor experience here in the park now that guides are required?
a. If you guided in the park before the requirement, have the changes been for better
or worse? For visitors? How about for wildlife?
6. Have your clients commented on the impact of requiring guides on their experience?
a. If so, how do you think it has impacted their experience?
b. Do you have a different type of client now due to the changes?
7. How would you characterize the general visitor experience here in the park now that group sizes are limited?
a. If you guided in the park before the requirement, have the changes been for better
or worse?
8. Have your clients commented on the group size limits?
a. If so, how do you think it has impacted their experience?
b. Do you think it has improved conditions for wildlife?
9. What suggestions do you have for the park management relative to the new regulations in Yellowstone? For example, how could their implementation be improved?

Soundscape Interview Guide

Visitor Characteristics

1. How often do you visit National Parks?

    A) How often have you visited Yellowstone National Park?
    B) How often have you visited in winter?
2. How did you enter the park today? (mode of transport)
3. What is the primary purpose of your visit today? (skiing, snowmobiling, watching wildlife, snow coach ride, etc.)

Undirected Broad Experience Questions

4. What attracted you to visit Yellowstone during the winter?
5. Could you describe what your visit was like today?
6. Is there anything that really added to your experience today? Please explain.
7. Is there anything that detracted from your experience today? Please explain.

More Directive Sound Questions

Intro: The questions I've just asked you dealt with your general experience with National Parks and in Yellowstone. The following questions I want to ask you are more specific to issues of sounds within Yellowstone.

8. How important are the sounds of the park to you during your visit?
9. Would you describe what the sounds of the park were today?
10. When did you begin to notice the sounds of the park?
11. Could you describe the experience of noticing the sounds of the park? What is that like?
12. Was there a single sound experience, whether human or natural, that distinctly affected you or that really stands out in your experience today?

Natural Sounds

13. Are there certain times during your park experience when natural sounds are important for your experience? (e.g., first entering the park, when out of a vehicle, in the backcountry, on a hiking trail, at Old Faithful, etc.) Why?
14. What does Yellowstone sound like in winter?
15. What does a geyser sound like?
16. Are there other distinctive natural sounds that are important to you here in Yellowstone?
17. How important do you think natural sounds are to enjoying your national park experience?
18. What is important to you about the natural sounds of the park?
19. If your ability to hear natural sounds were diminished, would it detract from, add to, or have no effect on your experience of Yellowstone?
    - If "add to," could you explain your answer?
    - If "detract from," could you explain your answer?
    - If "no effect," could you explain your answer?

20. Do you feel that the National Park Service should preserve and protect natural sounds and restore natural sound conditions?
    - If yes, can you explain your answer?
    - If no, can you explain your answer?

Mechanical and Human Sounds

21. Are there any human-caused sounds that have positively affected your visit? Explain
22. Are there any human-caused sounds that have negatively affected your visit? Explain.
23. How do you feel about sounds caused by the different types of vehicles used within the park?
    - More generally, how do you feel about the different types of vehicles used within the park?
24. Are there certain places in the park where you feel the sounds of motorized vehicles are acceptable? Explain.
25. Are there any places in the park where you feel the sounds of motorized vehicles are not acceptable? Explain.

Ideal Winter Visit

26. What would the park sound like in your ideal winter visit?
    A) Did you have this experience? Why or why not?
    B) Is this type of experience realistic? Why or why not?
27. What suggestions would you have for creating a park visit that aligns more closely with your ideal?
28. Would you support or oppose a management policy that restricts motorized visitor access in order to ensure that YNP provides opportunities to experience natural sounds? Explain

Survey Log for non response bias on quantitative instruments.

Date	Time	Location	Weather	Group Size	User Type	Question 1

1. What is your impression of the winter setting at Yellowstone National Park:

	Very	Somewhat	Neither	Somewhat	Very	
Acceptable	□	□	□	□	□	Unacceptable