National Park Service
U.S. Department of the Interior

Grand Teton/Yellowstone National Parks
John D. Rockefeller, Jr., Memorial Parkway
Wyoming/Montana/Idaho

Temporary Winter Use Plans Environmental Assessment

August 2004

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Environmental Assessment

Temporary Winter Use Plans

GRAND TETON/YELLOWSTONE
National Parks

John D. Rockefeller, Jr.,
Memorial Parkway
Wyoming/Montana/Idaho

SUMMARY

This environmental assessment considers various alternatives for a temporary winter use plan in Yellowstone and Grand Teton National Parks and the John D. Rockefeller, Jr., Memorial Parkway. Alternatives considered include one allowing only mass- transit snowcoaches, and four permitting both snowcoaches and snowmobiles, with varying restrictions to protect park resources. Alternative 4, the preferred alternative, allows 720 snowmobiles per day in Yellowstone and 140 per day in Grand Teton for a period of up to three winters (i.e., through the winter of 2006- 2007. This alternative requires all snowmobiles are to be best available technology, and requires that all snowmobilers travel with commercial guides in Yellowstone.

PUBLIC COMMENT

If you wish to comment on the environmental assessment, you may mail comments to the address below. You may also comment online at: www.nps.gov/yell/winteruse- ea. Comments on this environmental assessment must be received by midnight, September 20, 2004. Please note that names and addresses of people who comment become part of the public record. If you wish us to withhold your name and/or address, you must state this prominently at the beginning of your comment. We will make all submissions from organizations, businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses available for public inspection in their entirety.

Yellowstone National Park
Temporary Winter Use EA Public Comments
PO Box 168
Yellowstone National Park, Wyoming 82190

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INTRODUCTION: WINTER USE HISTORY

In 1990, the National Park Service completed a Winter Use Plan for Yellowstone National Park, Grand Teton National Park, and the John D. Rockefeller, Jr., Memorial Parkway (the Parkway; collectively, the parks). That plan projected year 2000 winter visitation to be 143,000 visitors in Yellowstone, a number that was nearly exceeded by the winter of 1992–1993 (total visitors to Yellowstone and Grand Teton in that year were 142,744 and 128,159, respectively). The same winter, the Continental Divide Snowmobile Trail opened in Grand Teton. These two changes prompted the Greater Yellowstone Coordinating Committee, composed of national park superintendents and national forest supervisors within the Greater Yellowstone Area (GYA), to collect information and analyze winter use in the entire GYA. The interagency study team released its results in 1999 as "Winter Visitor Use Management: A Multi- agency Assessment." The assessment identified desired conditions for the GYA, current areas of conflict, issues and concerns, and possible ways to address them. The final document incorporated many comments from the public, interest groups, and local and state governments surrounding public lands in the GYA.

In May 1997, the Fund for Animals, Biodiversity Legal Foundation, and certain other plaintiffs filed suit against the NPS, following the extraordinary winter of 1996–1997 and the killing of 1,084 bison. The groups alleged violations of the Endangered Species Act, the National Environmental Policy Act (NEPA), among other laws. In October 1997, the Department of the Interior and the plaintiffs reached a settlement agreement wherein the NPS agreed, in part, to prepare an environmental impact statement (EIS) for new winter use plans for the parks. In completing the EIS, the NPS used the expertise of the states of Montana, Idaho, and Wyoming; Fremont County in Idaho, Gallatin and Park Counties in Montana, and Park and Teton Counties in Wyoming; and the U.S. Forest Service. The Final EIS, released on October 10, 2000, proposed to eliminate both snowmobile and snowplane use from the parks by the winter of 2003–2004, and provide access via an NPS- managed, mass- transit snowcoach system. This was Final EIS alternative G, which satisfied the EIS portion of the settlement agreement. NPS Intermountain Regional Director Karen Wade signed the Record of Decision (ROD) completing that choice on November 22, 2000. The ROD was based upon the finding that existing snowmobile and snowplane use impaired the parks' resources and values, thus violating the statutory mandate of the NPS. Because the decision necessitated changes in the routes available for oversnow motorized access, a change to the regulations was necessary. Following publication of a proposed rule and the subsequent public comment period, a final rule was published in the Federal Register on January 22, 2001. After additional review, the rule became effective on April 22, 2001. Full implementation of the plan and the rule changes were scheduled to take place in the winter of 2003–2004.

On December 6, 2000, the International Snowmobile Manufacturers' Association (ISMA) and several other plaintiffs sued the Secretary of the Interior and the NPS. The State of Wyoming intervened on behalf of the plaintiffs. The lawsuit asked for the decision to ban snowmobiles, as reflected in the ROD, to be set aside. ISMA alleged, among other things, violations of NEPA. The Interior Department settled with ISMA on June 29, 2001, with an agreement that the NPS would prepare a Supplemental Environmental Impact Statement (SEIS). The NPS used the

expertise of the Environmental Protection Agency (EPA) in addition to that of the same cooperating agencies as in the previous EIS.

In late 2001 the National Park Service began the SEIS, focusing on the cleaner and quieter snowmobiles becoming commercially available then. To give itself time to complete the SEIS, the NPS subsequently delayed its previous snowmobile phase- out by one year, as published in the Federal Register on Nov. 18, 2002 (thus, the phase- out would begin in 2003–2004). On February 20, 2003, the NPS issued the Final SEIS, which proposed to continue allowing snowmobile use under three strict conditions: 1) winter visitation was to be limited to no more than 950 snowmobiles daily in Yellowstone; 2) all snowmobiles would have to use the best available technology; and 3) snowmobilers would have to be led by trained guides. Regional Director Karen Wade signed the ROD on March 25, 2003, and the new regulation governing winter use in the parks was published in the Federal Register on December 11, 2003.

On December 16, 2003, the U.S. District Court for the District of Columbia (D.C. District Court), ruling on lawsuits from the Fund for Animals and the Greater Yellowstone Coalition, vacated the December 11, 2003, regulation and the SEIS. The court reinstated the January 22, 2001, regulation phasing out recreational snowmobiling (the first EIS) pursuant to the delay rule. Specifically, up to 493 snowmobiles a day were to be allowed into Yellowstone for the 2003–2004 season, and another 50 in Grand Teton and the Parkway combined. All snowmobiles in Yellowstone were required to be led by a commercial guide. Snowmobiles were to be phased out entirely from the parks in the 2004–2005 season.

ISMA and the State of Wyoming reopened their December 2000 lawsuit against the Interior Department and the NPS. Ruling upon the reopened suit on February 10, 2004, the Wyoming federal district court issued a preliminary injunction preventing the NPS from continuing to implement the snowmobile phase- out (the January 22, 2001, regulation). The court also directed the superintendents of Yellowstone and Grand Teton to issue emergency orders that were "fair and equitable" to all parties to allow visitation to continue for the remainder of the winter season. The NPS responded by allowing up to 780 snowmobiles a day into Yellowstone and up to 140 into Grand Teton and the Parkway combined. In Yellowstone, the requirement that all snowmobilers travel with a commercial guide remained in effect.

Judicial proceedings are continuing in both the Wyoming and Washington, D.C., courts.

PURPOSE

The purpose of the Temporary Winter Use Plans Environmental Assessment is to ensure that park visitors have a range of appropriate winter recreational opportunities for an interim period, pending completion of a long- term analysis on winter use. The purpose of this EA is also to ensure that these recreational activities are in an appropriate setting and that they do not impair or irreparably harm park resources or values. The NPS Organic Act, which is the fundamental law guiding national park management, mandates both of these purposes in that it requires that park resources are protected in an unimpaired condition, while allowing for their enjoyment.

Another purpose of this EA is to allow the NPS to collect additional monitoring data on strictly limited public recreational snowmobile and snowcoach use. For some time, the NPS has been monitoring air quality, natural soundscapes, wildlife, visitor experience, water quality, and employee health and safety. The winter of 2003–2004 was the first winter of strictly limited and

managed public recreational snowmobile use since the program's inception in 1963. The new monitoring information from that winter and the winter of 2004–2005 will be important in developing a long- term plan. This information will be used in preparation of a long- term analysis and permanent regulation for winter use management in the parks. In addition, this EA will allow the NPS to incorporate monitoring information from the winter of 2003–2004 to help guide and evaluate the 2004- 2005 season.

There is substantial confusion and uncertainty among the public about winter use, as illustrated by park visitation statistics from the 2003–2004 season. Another purpose of the Temporary Winter Use Plans EA is to provide the public with some degree of certainty about how winter use will be managed in the parks for an interim period. However, the timeframe for completing the EA and revising the parks' regulations will not provide much advance notice of the NPS's final decision before the start of the 2004–2005 winter season.

The final purpose of this EA is to provide a structure for winter use management in the parks for an interim period. Due to the litigation in federal courts in Wyoming and Washington, D.C., it is currently unclear what winter use management plan will be in place for the winter of 2004–2005 or future winters and whether snowmobiles will be permitted. However, the purpose of this EA is to provide an interim winter use plan pending completion of a long- term winter use analysis that would further address concerns identified by both courts.

This EA is not intended to result in a permanent regulation authorizing continued public recreational snowmobile use in the parks. A permanent regulation on snowmobile use in the parks would be the product of a long- term winter use analysis.

NEED

The NPS is affirmatively taking action through this EA to shape the course of winter use management in the three parks. As stated in the introduction of this chapter, the U.S. District Court for the District of Columbia vacated the SEIS Record of Decision of March 2003 and the implementing regulations of December 11, 2003. That court effectively reinstated the January 22, 2001, regulations, as modified by the November 18, 2002, regulations phasing out snowmobile use by the winter of 2004–2005. However, on February 10, 2004, the U.S. District Court for the District of Wyoming preliminarily enjoined the NPS from implementing the January 22, 2001, snowmobile phase- out regulations. The court directed the NPS to publish temporary regulations for the remainder of the winter use season. The NPS responded on February 11, 2004, with superintendents' orders allowing limited snowmobile use.

Due to these court decisions, neither the winter use regulations promulgated in 2001 and 2003 are currently in effect in the parks. The NPS general regulations governing snowmobile use at 36 CFR 2.18 state that snowmobiles are prohibited in units of the National Park System unless snowmobile routes and water surfaces are promulgated as special regulations in accordance with the Administrative Procedure Act.

Thus, the need for this EA is to outline the type and extent of public recreational snowmobile access to Yellowstone and Grand Teton National Parks that would be allowed for up to three winters. Part of the decision includes the type and extent of restrictions on public recreational snowmobile use, if it is allowed how winter use will be managed in the three park units, and

specifically, whether snowmobiles will be permitted. This EA process will culminate with revisions to the parks' winter use regulations at 36 CFR 7.13, 7.21, and 7.22.

The desired condition of the three parks for winter use has not changed since the 2000 EIS was prepared. As stated on pages 6–7 of the Final EIS, the desired condition stems from NPS mandates, which include legislation, regulations, executive orders, and governing policies.

The desired conditions are:

- Visitors have a range of appropriate winter recreation opportunities from primitive to developed. Winter recreation complements the unique characteristics of each landscape within the ecosystem.
- Recreational experiences are offered in an appropriate setting; they do not take place where they will irreparably impact air quality, wildlife, cultural areas, the experiences of other park visitors, or other park values and resources.
- High quality facilities are provided in parks to support the need for safety and enhanced visitor experiences.
- Conflicts among user groups are minimal.
- Visitors know how to participate safely in winter use activities without damaging resources.
- Oversnow vehicle sound and emission levels are reduced to protect employee and public health and safety, enhance visitor experience, and protect natural resources.

HISTORICAL CONDITIONS

The historical conditions described below are identical to those outlined in the Final EIS and the Final SEIS. They describe the unlimited and essentially unregulated snowmobile use that occurred until the winter of 2003–2004.

- **Visitor Access:** Access to most locations was limited to those who could afford to ride a snowcoach or snowmobile. Access for personal motorized use via snowmobile increased greatly in the three parks. Snowmobile use in these numbers was in conflict with use of the parks by other visitors.
- **Visitor Experience:** A variety of winter use conflicts was identified involving the relationship between users and among different user groups, which affected how people experience the parks. At destination facilities and trails open to both motorized and non-motorized users, non- motorized users expressed dissatisfaction with the sound, odor, and quantity of snowmobiles. These vehicles affected the solitude, quiet, and clean air and other resource values that many people expect and wish to enjoy in national parks.
- **Visitor Safety:** The level of snowmobile accidents, unsafe users, inherent winter risks, and conflicts between users was a concern from the standpoint of public safety.
- **Resources:** The parks documented health hazards from snowmachine emissions, harassment of and unintended impacts on wildlife from groomed roads and their use, degradation of air quality- related values, and impacts on the natural soundscape. Many people strongly objected to the degradation of inherent park values, as well as how these impacts affect people and their recreational opportunities.

Visitation to the parks substantially changed during the winter of 2003–2004, as described in Chapter III, Affected Environment. The question of whether the conditions associated with the

winter of 2003–2004 are consistent with the desired conditions is part of the analysis undertaken in this EA.

SCOPE OF ANALYSIS – RANGE OF ALTERNATIVES CONSIDERED

The scope of analysis determines the range of alternatives to be considered. The 2000 EIS evaluated seven alternatives for managing winter use. As required by the June 29, 2001, settlement agreement with ISMA and the State of Wyoming, the 2003 SEIS focused on allowing new information and additional public comment. Three additional alternatives allowing continued snowmobile use were considered, as well as an alternative allowing only snowcoaches (the "no action" alternative).

This EA will focus on analyzing the environmental impacts of five alternatives for interim winter use. They are not dramatically different from alternatives considered in the SEIS or the EIS; thus, this EA incorporates references to these documents as appropriate. The decision to be made in this EA considers the conclusions in the 2000 EIS and the 2003 SEIS regarding adverse impacts and the finding in the November 2000 ROD and affirmed in the March 2003 ROD that the historically unlimited and essentially unregulated snowmobile use constitutes an impairment of park resources and values.

The EA will consider alternatives that are not likely to have significant impacts to the human environment. Under Council on Environmental Quality regulations, an EA must lead to a "Finding of No Significant Impact" (FONSI) or a decision to prepare an EIS. An EA can only authorize actions that will not have "significant" impacts. Generally, the NPS may only authorize activities that may lead to "significant" impacts through an EIS. NPS lacks the discretion to authorize activities that would impair park resources or values.

The Council on Environmental Quality defines "significantly" at 40 CFR 1508.27. It requires that significance be considered in both context and intensity. The regulations state that the following factors should be considered in evaluating intensity:

a. Impacts that may be both beneficial and adverse. A significant effect may exist even if the federal agency believes that on balance the effect will be beneficial.
b. The degree to which the proposed action affects public health or safety.
c. Unique characteristics of the geographic area, such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.
d. The degree to which the effects on the quality of the human environment are likely to be highly controversial.
e. The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.
f. The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.
g. Whether the action is related to other actions with individually insignificant but cumulatively significant impacts. Significance exists if it is reasonable to anticipate a cumulatively significant impact on the environment. Significance cannot be avoided by terming an action temporary or by breaking it down into small component parts.

h. The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historic resources.
i. The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act of 1973.
j. Whether the action threatens a violation of federal, state, or local law or requirements imposed for the protection of the environment.

WINTER USE PLAN ELEMENTS NOT RE- EVALUATED IN THIS EA

This EA will not re- evaluate decisions about the management of winter recreational use that have already been implemented, including the prohibition of snowplanes on Jackson Lake (which were found to impair park resources and values) and motorized activities on Teton Park Road (changes that were made before the 2002–2003 season began). These decisions were supported by the analysis in the 2000 EIS, which remains relevant and is incorporated by reference. The analysis done in the 2000 EIS indicated that snowplane use on Jackson Lake results in impairment of park resources and values. The NPS has no reason to doubt the validity of that analysis.

DECISION TO BE MADE

The decision to be made in this planning and environmental compliance process is the type and extent of public recreational snowmobile access to Yellowstone and Grand Teton National Parks that would be allowed for up to three winters. Part of the decision includes the type and extent of restrictions on public recreational snowmobile use, if it is allowed.

PUBLIC INVOLVEMENT

The public scoping period for this EA was open from June 14 to July 13, 2004. The NPS received 15,083 documents commenting on the scope of the EA, including 13,637 in electronic format and 1,446 in hard copy. Of the these documents, 10,534 were one of ten different form letters received; 4,201 were personal or "non- form" letters (some people sent more than one kind of form letter as well as one or more non- form letters, so the form/non- form total does not match the total number of documents). At least nine people from every state in the country sent comments, plus four from Puerto Rico. Although 2,566 Californians submitted comments, only 8% of the commenters were from the three states intersecting in Yellowstone: 534 from Montana, 334 from Wyoming, and 324 from Idaho.

Although this public scoping period was primarily intended to allow people to comment upon the scope of this Environmental Assessment, many people expressed their opinions regarding winter use management in Yellowstone. A detailed breakdown of the public scoping comments and opinions on winter use management is provided in Appendix C.

MAJOR ISSUES

The Final EIS and the Final SEIS describe major issues (based on public comments) that relate to the purpose and need for action for future winter use in the three NPS units. These issues parallel the historical conditions identified above and are briefly summarized here. The purpose of developing alternatives is to compare different means of resolving these issues. These issues were critical for evaluating and disclosing impacts in the Final EIS and the Final SEIS, and they remain the focus of this EA.

SOCIAL AND ECONOMIC ISSUES

Many public comments referred to the effect of changes in park management decisions on local communities. Local businesses provide services to visitors near the parks, and many local economies rely, in part, on revenues from park visitors in the winter. Concern was voiced that eliminating oversnow travel and snowmobiles in particular or closing a park entrance during the winter could have a detrimental effect on local economies. Other commenters stated that concern for the parks' resources was more important than economics.

HUMAN HEALTH AND SAFETY

Four primary health and safety issues regarding winter visitor use were identified that affect different areas of the three NPS units to a varying extent:

- The effect of motorized vehicular emissions and noise on employees and visitors.
- Speed limits and the frequency of motor vehicle accidents and fatalities, as well as the number of nighttime collisions involving wildlife.
- Avalanche hazards.
- Safety problems where different modes of winter transport are used in the same place or close proximity.

WILDLIFE

- The impact of snowmobiles and snowcoaches on wildlife .

AIR QUALITY

- The impact of snowmobile and snowcoach emissions on air quality and air quality- related values.

NATURAL SOUNDSCAPES

- The impact of noise from snowmobiles and snowcoaches on the natural soundscape .

VISITOR USE AND ACCESS

Various user groups contend that the national parks offer either too much or not enough of various types of use. Many people contend that motorized use has greatly affected opportunities for non- motorized use in the GYA. People who advocate for snowmobile use, including service

and equipment providers in gateway communities, indicate that there is a right to personal (individual) access to the parks for this use.

VISITOR EXPERIENCE

Expectations for quality winter recreation experiences vary among user groups. This creates contention between those for whom the expectation of quiet, solitude, and clean air conflicts with the impacts of snowmobiles, especially when facilities for these different groups are in close proximity. At issue is the nature of visitor enjoyment and its relationship to park resources and values.

ISSUES OR CONCERNS NOT ADDRESSED IN THIS ENVIRONMENT ASSESSMENT

The Final EIS and the Final SEIS identified issues beyond the scope of those analyses. This EA is focused solely on considering a temporary winter use plan, and more specifically, whether public recreational snowmobiles may be permitted without causing significant impacts to park resources and values. A number of concerns and issues that were raised during the previous EIS and SEIS and were determined to be outside the scope of those analyses are likewise outside the scope of this EA. These include: privatization of park facilities, wildlife carrying capacities, multiple- uses of national park lands, economic effects of park concessions, NEPA procedures, and NPS policies.

UNGULATE USE OF GROOMED ROADS

The NPS has contracted with an independent researcher, Dr. Cormack Gates of the University of Calgary, to produce a thorough assessment of what is known about bison movements and dispersal. The study will link science, within the context of movement ecology, to the management of road grooming. It will analyze existing data from a variety of sources and interview subject- matter experts as well as other parties and organizations to seek additional ecological knowledge about bison movements and dispersal in the Yellowstone ecosystem. The report will provide recommendations within an adaptive management framework for addressing the issue of bison movements and dispersal, including priority areas for further research. However, the final report will not be completed until March 2005. In the meantime, there is no evidence that the continuation of road grooming would cause population level impacts to elk or bison (the potential for population- level impacts are addressed in the bison and elk section of chapter 4 in this EA). In addition, both bison and elk populations are currently at sound levels. Further, these alternatives to not preclude the park superintendents from taking emergency actions to protect park resources under 36 CFR 1.5 should such a need arise. However, the report will be fundamental to the long- term analysis of winter use in the parks, which will consider alternatives that would eliminate road grooming on some or all park roads.

Further details about bison use of groomed roads, including summaries of the various scientific literature and these experts' alternative conclusions, are discussed in Chapter III, Affected Environment, Additional Topics Dismissed in this EA, and in Chapter 4, The Effects of Implementing the Alternatives on Bison and Elk.

ADMINISTRATIVE USE OF SNOWMOBILES AND SNOWCOACHES

NPS, park concessionaires, contractors, researchers, and other duly permitted parties depend on snowmobiles and snowcoaches for their administrative functions. These uses of the parks are not within the scope of this EA, and are likewise not addressed. These administrative uses are necessary for the parks to carry out their missions in accordance with the NPS Organic Act, and are focused on ensuring the health and safety of visitors and park residents, providing for public enjoyment of the parks, and protecting park resources.

NPS MANDATES

The management of the National Park System and NPS programs is guided by the U.S. Constitution, public laws, treaties, proclamations, Executive Orders, regulations, and directives of the Secretary of the Interior and the Assistant Secretary for Fish and Wildlife and Parks. NPS policy must be consistent with these higher authorities and with appropriate delegations of authority. In order of this hierarchy, pertinent guidance is summarized below.

THE ORGANIC ACT

The NPS and its basic mandate are authorized under the NPS Organic Act (16 USC 1, 2–4) and the General Authorities Act (16 USC 1a–1 through 1a–8):

> "The Service thus established shall promote and regulate the use of the Federal areas known as National Parks…by such means and measures as to conform to the fundamental purposes of the said Parks…which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

The direction provided by the Organic Act was the subject of many comments on the Draft Environmental Impact Statement (Draft EIS) and these are discussed in the Final EIS (page 3).

THE GENERAL AUTHORITIES ACT

The General Authorities Act, as amended by the Redwood Act (March 27, 1978, P.L. 95–250, 92 Stat. 163, 16 USC 1a–1) affirms the basic tenets of the Organic Act and provides additional guidance on National Park System management:

> "The authorization of activities shall be construed, and the protection, management and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established…."

The restatement of these principles of park management in the Redwood Act is intended to serve as the basis for any judicial resolution of competing private and public values and interests in the National Park System (Senate Report No. 95–528 on S. 1976 pg. 7). The Senate committee report stated that under the Redwood amendment:

> "The Secretary of the Interior has an absolute duty, which is not to be compromised, to fulfill the mandate of the 1916 Act to take whatever actions and seek whatever relief as will safeguard the units of the National Park System."

Consideration of these principles gives rise to the concept of "impairment" discussed on page 3 of the Final EIS, and below under Management Policies 2001.

PARK- SPECIFIC LEGISLATION

The Yellowstone National Park Act (16 USC 21, et seq.), the Grand Teton National Park Act (16 USC 406d–1 et seq.), and the John D. Rockefeller, Jr., Memorial Parkway Act (P.L. 92- 404) provide authority and direction for management of each park addressed in the Final SEIS. The establishment legislation is included in Appendix C of the Final EIS.

OTHER LAWS

Because one of the primary issues about snowmobile use is that of air quality, the Clean Air Act (as amended, P.L. Chapter 360, 69 Stat. 322, 42 U.S.C. 7401 et seq.) is a primary focus in both the Final EIS and in the Final SEIS. Other pertinent laws are listed on page 3 of the Final EIS.

Clean Air Act

The Clean Air Act provides both for the prevention of significant deterioration of areas where air is cleaner than National Ambient Air Quality Standards (NAAQS), and for an affirmative responsibility by the federal land manager to protect air quality- related values, including visibility. The federal land manager, in this case the NPS, has an affirmative responsibility to protect these resources, which is a separate issue from air quality vis- à- vis the NAAQS.

The Prevention of Significant Deterioration (PSD) provisions of the Clean Air Act are intended, in part, to preserve, protect, and enhance the air quality in national parks. The legislative history of the PSD provisions (S. Rep 95–127, 95th Cong., 1st Sess., 1977) indicates that federal land managers are to "assume an aggressive role in protecting the air quality values of land areas under his jurisdiction" and to "err on the side of protecting the air quality- related values for future generations." The Act also requires the prevention of any future impairment and the remedying of any existing impairment in Class I federal areas, which includes Yellowstone and Grand Teton National Parks. Additionally, the John D. Rockefeller, Jr., Memorial Parkway (a Class II area) abuts Class I federal areas, including the two national parks and the Jedediah Smith and Teton Wilderness Areas.

Executive Orders

EO 11644, Use of Off- Road Vehicles on the Public Lands, issued by President Nixon in 1972, states, "The widespread use of such vehicles on the public lands—often for legitimate purposes but also in frequent conflict with wise land and resource management practices, environmental values, and other types of recreational activity—has demonstrated the need for a unified federal policy…that will ensure that the use of off- road vehicles on public lands will be controlled and directed so as to protect the resources of these lands, to promote the safety of all users of those lands, and to minimize conflicts among the various users of those lands." Further, "[a]reas and trails shall be located to minimize harassment of wildlife or significant disruption of wildlife

habitats" and "areas and trails shall be located to minimize conflicts between off- road vehicle use and other existing or proposed recreational uses of the same or neighboring public lands…." Additionally, "Areas and trails shall be located in areas of the National Park System…only if the respective agency head determines that off- road vehicle use in such locations will not adversely affect their natural, aesthetic, or scenic values." Finally, "The respective agency head shall monitor the effects of the use of off- road vehicles on lands under their jurisdictions. On the basis of the information gathered, they shall from time to time amend or rescind designation of areas or other actions taken pursuant to this order as necessary to further the policy of this order."

Under the Executive Orders, the term "off- road vehicle" specifically excludes "any vehicle whose use is expressly authorized by the respective agency head under a permit, lease, license, or contract." Executive Order No. 11644 § 2(3)(C).

This order is amended by EO 11989, issued by President Carter in 1978, which adds:

> "…the respective agency head shall, whenever he determines that the use of off- road vehicles will cause or is causing considerable adverse effects on the soil, vegetation, wildlife, wildlife habitat or cultural or historic resources of particular areas or trails of the public lands, immediately close such areas or trails to the type of off- road vehicle causing such effects, until such time as he determines that such adverse effects have been eliminated and that measures have been implemented to prevent future recurrence."

Regulations

General provisions in NPS regulations address snowmobile use (36 CFR 2.18). Snowmobiling is generally prohibited except on designated routes and water surfaces available for motorized use at other times. In addition, snowmobiles are prohibited except where designated and "only when their use is consistent with the park's natural, cultural, scenic and aesthetic values, safety considerations, park management objectives, and will not disturb wildlife or damage park resources" (36 CFR 2.18c). Section (d) of this regulation lists additional limitations and prohibitions that apply where snowmobiles are allowed, including noise limits, speed limits, operator requirements, and machine appurtenances.

NPS MANAGEMENT POLICIES

Current policy guidance for the NPS is published in Management Policies 2001 (December 2000; available on the Internet at www.nps.gov/policy/mp/policies.html). The policies interpret the laws, regulations, and EOs governing management of National Park System units. The policies most applicable to this EA are summarized or abstracted here. The numbers below refer to the portions of the Management Policies 2001 that are the sources for the text.

1.4.3 The NPS Obligation to Conserve and Provide for Enjoyment of Park Resources and Values

> "The fundamental purpose of the National Park System, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with the mandate to conserve park resources and values. This mandate is independent of the separate prohibition on impairment, and so applies all the time, with respect to all park resources and values, even when there is no risk that any park resources or values may be impaired.

NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts on park resources and values. However, the laws do give the Service the management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, so long as the impact does not constitute impairment of the affected resources and values."

"The fundamental purpose of all parks also includes providing for the enjoyment of park resources and values by the people of the United States. The "enjoyment" that is contemplated by the statute is broad; it is the enjoyment of all the people of the United States, not just those who visit parks, and so includes enjoyment both by people who directly experience parks and by those who appreciate them from afar. It also includes deriving benefit (including scientific knowledge) and inspiration from parks, as well as other forms of enjoyment. Congress, recognizing that the enjoyment by future generations of the national parks can be ensured only if the superb quality of park resources and values is left unimpaired, has provided that when there is a conflict between conserving resources and values and providing for enjoyment of them, conservation is to be predominant. This is how courts have consistently interpreted the Organic Act, in decisions that variously describe it as making 'resource protection the primary goal' or 'resource protection the overarching concern,' or as establishing a 'primary mission of resource conservation,' a 'conservation mandate,' 'an overriding preservation mandate,' 'an overarching goal of resource protection.' Or 'but a single purpose, namely, conservation."

1.4.4 The Prohibition on Impairment of Park Resources and Values

"While Congress has given the Service the management discretion to allow certain impacts within parks, that discretion is limited by the statutory requirement (enforceable by the federal courts) that the Park Service must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. This, the cornerstone of the Organic Act, establishes the primary responsibility of the National Park Service. It ensures that park resources and values will continue to exist in a condition that will allow the American people to have present and future opportunities for enjoyment of them."

"The impairment of park resource and values may not be allowed by the Service unless directly and specifically provided for by legislation or by the proclamation establishing the park. The relevant legislation or proclamation must provide explicitly (not by implication or inference) for the activity, in terms that keep the Service from having the authority to manage the activity so as to avoid impairment."

1.4.5 What Constitutes Impairment of Park Resources and Values

"The impairment that is prohibited by the Organic Act and the General Authorities Act is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. Whether an impact meets this definition depends on the particular resources and values that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts."

"An impact to any park resource or value may constitute an impairment. An impact would be more likely to constitute an impairment to the extent that it affects a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or
- Identified as a goal in the park's general management plan or other relevant NPS planning documents."

"An impact would be less likely to constitute an impairment to the extent that is an unavoidable result, which cannot reasonably be further mitigated, of an action necessary to preserve or restore the integrity of park resources or values. Impairment may occur from visitor activities; NPS activities in the course of managing a park; or activities undertaken by concessioners, contractors, and others operating in the park."

1.4.6 What Constitutes Park Resources and Values

"The park resources and values that are subject to the nonimpairment standard include:

- The park's scenery, natural and historic objects, and wildlife, and the processes and conditions that sustain them, including to the extent present in the park: the ecological, biological, and physical processes that created the park and continue to act upon it; scenic features; natural visibility, both in daytime and at night; natural landscapes; natural soundscapes and smells, water and air resources; soils; geological resources; paleontological resources; archeological resources; cultural landscapes; ethnographic resources; historic and prehistoric sites, structures, and objects; museum collections; and native plants and animals;
- Opportunities to experience enjoyment of the above resources, to the extent that can be done without impairing any of them;
- The park's role in contributing to the national dignity, the high public value and integrity and the superlative environmental quality of the National Park System, and the benefit and inspiration provided to the American people by the National Park System; and
- Any additional attributes encompassed by the specific values and purposes for which it was established."

1.4.7 Decision- making Requirements to Avoid Impairments

"Before approving a proposed action that could lead to an impairment of park resources and values, an NPS decision maker must consider the impacts of the proposed action and determine, in writing, that the activity will not lead to an impairment of park resources and values. If there would be an impairment, the action may not be approved."

"In making a determination of whether there would be an impairment, a National Park Service decision maker must use his or her professional judgment. The decision maker must consider any environmental assessments or environmental impact statements required by the National Environmental Policy Act of 1969 (NEPA); relevant scientific studies, and other sources of information; and public comments."

"When an NPS decision maker becomes aware that an ongoing activity might have led or might be leading to an impairment of park resources and values, he or she must investigate and determine if there is, or will be, an impairment. Whenever practicable, such an investigation and determination will be made as part of an appropriate park planning process undertaken for other purposes. If it is determined that there is, or will be, such an impairment, the Director must take appropriate action, to the extent possible within the Service's authorities and available resources, to eliminate the impairment. The action must eliminate the impairment as soon as reasonably possible, taking into consideration the nature, duration, magnitude, and other characteristics of the impacts to park resources and values, as well as the requirements of NEPA, the Administrative Procedure Act, and other applicable law."

4.7.1 Air Quality

"The National Park Service has a responsibility to protect air quality under both the 1916 Organic Act and the Clean Air Act (CAA). Accordingly, the Service will seek to perpetuate the best possible air quality in the parks to (1) preserve natural resources and systems; (2) preserve cultural resources; and (3) sustain visitor enjoyment, human health, and scenic vistas. Vegetation, visibility, water quality, wildlife, historic and prehistoric structures and objects, cultural landscapes, and most other elements of a park environment are sensitive to air pollution and are referred to as 'air quality- related values.' The Service will assume an aggressive role in promoting and pursuing measures to protect these values from the adverse impacts of air pollution. In cases of doubt as to the impacts of existing or potential air pollution on park resources, the Service will err on the side of protecting air quality and related values for future generations."

"Superintendents will take actions consistent with their affirmative responsibilities under the CAA to protect air quality- related values in Class I areas. Class I areas are national parks over 6,000 acres and national wilderness areas over 5,000 acres that were in existence on August 7, 1977. The CAA establishes a national goal of preventing any future, and remedying any existing, human- made visibility impairment in Class I areas."

"Although the CAA gives the highest level of air quality protection to Class I areas, it provides many opportunities for the Service to participate in the development of pollution control programs to preserve, protect, and enhance the air quality of all units of the National Park System. Regardless of Class I designation, the Service will take advantage of these opportunities."

4.9 Soundscape Management

"The National Park Service will preserve, to the greatest extent possible, the natural soundscapes of parks. Natural soundscapes exist in the absence of human- caused sound. The natural soundscape is the aggregate of all the natural sounds that occur in parks, together with the physical capacity for transmitting natural sounds. Natural sounds occur within and beyond the range of sounds that humans can perceive, and can be transmitted through air, water, or solid materials. Some natural sounds in the natural soundscape are also part of the biological or other physical resource components of the park. Examples of such natural sounds include: ….sounds produced by physical processes, such as wind in the trees, claps of thunder, or falling water. The Service will restore degraded soundscapes to the natural condition wherever possible, and will protect natural soundscapes from degradation due to noise (undesirable human- caused sound)."

"Using appropriate management planning, superintendents will identify what levels of human- caused sound can be accepted within the management purposes of parks. The frequencies, magnitudes, and duration of human- caused sound considered acceptable will vary throughout the park, being generally greater in developed areas and generally lesser in undeveloped areas. In and adjacent to parks, the Service will monitor human activities that generate noise that adversely affects park soundscapes, including noise caused by mechanical or electronic devices."

"The service will take action to prevent or minimize all noise that, through frequency, magnitude, or duration, adversely affects the natural soundscape or other park resources or values, or that exceeds levels that have been identified as being acceptable to, or appropriate for, visitor uses at the sites being monitored."

8.2 Visitor Use

"Enjoyment of park resources and values by the people of the United States is part of the fundamental purpose of all parks. The Service is committed to providing appropriate, high quality opportunities for visitors to enjoy the parks, and will maintain within the parks an atmosphere that is open, inviting, and accessible to every segment of American society. However, many forms of recreation enjoyed by the public do not require a national park setting and are more appropriate to other venues. The Service will therefore:

- Provide opportunities for forms of enjoyment that are uniquely suited and appropriate to the superlative natural and cultural resources found in the parks.
- Defer to local, state, and other federal agencies; private industry; and non-governmental organizations to meet the broader spectrum of recreational needs and demands."

"To provide for enjoyment of the parks, the National Park Service will encourage visitor activities that:

- Are appropriate to the purposes for which the park was established;
- Are inspirational, educational, or healthful and otherwise appropriate to the park environment;
- Will foster an understanding of, and appreciation for, park resources and values, or will promote enjoyment through a direct association with, interaction with, or relation to park resources; and
- Can be sustained without causing unacceptable impacts to park resources or values."

"The Service will allow other visitor uses that do not meet all the above criteria if they are appropriate to the purpose for which the park was established and they can be sustained without causing unacceptable impacts to park resources or values. Unless mandated by statute, the Service will not allow visitors to conduct activities that:

- Would impair park resources or values;
- Create an unsafe or unhealthful environment for other visitors or employees;
- Are contrary to the purposes for which the park was established, or
- Unreasonably interfere with: the atmosphere of peace and tranquility, or the natural soundscape maintained in wilderness and natural, historic or commemorative locations within the park; NPS interpretive, visitor service, administrative or other activities; NPS concessioner or contractor operations or services or other existing,

appropriate park uses."

"Management controls must be imposed on all park uses to ensure that park resources and values are preserved and protected for the future. If and when a superintendent has a reasonable basis for believing that an ongoing or proposed public use would cause unacceptable impacts to park resources or values, the superintendent must make adjustments to the way the activity is conducted, so as to eliminate the unacceptable impacts. If necessary, the superintendent may (1) temporarily or permanently close a specific area; (2) prohibit a particular use; or (3) otherwise place limitations on the use to ensure that impairment does not occur."

8.2.3 Use of Motorized Equipment

"The variety of motorized equipment—including visitor vehicles, concessioner equipment, and Park Service administrative or staff vehicles and equipment—that operates in national parks has the potential to adversely impact park resources, including the park's natural soundscape. In addition to their natural values, natural sounds, such as waves breaking on the shore, the roar of a river, and the call of a loon, form a valued part of the visitor experience. Conversely, the sounds of motor vehicle traffic, an electric generator, or loud music can greatly diminish the solemnity of a visit to a national memorial, the effectiveness of a park interpretive program, or the ability of a visitor to hear a bird singing its territorial song."

"The Service will strive to preserve or restore the natural quiet and natural sounds associated with the physical and biological resources of parks. To do this, superintendents will carefully evaluate and manage how, when, and where motorized equipment is used by all those—including park staff—who operate equipment in the parks. Uses and impacts associated with the use of motorized equipment will be addressed in park planning processes. Where such use is necessary and appropriate, the least impacting equipment, vehicles, and transportation systems should be used, consistent with public and employee safety. The natural ambient sound level—that is, the environment of sound that exists in the absence of human- caused noise—is the baseline condition, and the standard against which current conditions in a soundscape will be measured and evaluated."

8.2.3.1 Off- road Vehicle Use

"Off- road motor vehicle use in national park units is governed by EO 11644 (as amended by EO 11989), which defines off- road vehicles as 'any motorized vehicle designed for or capable of cross- country travel on or immediately over, land, water, sand, snow, ice, marsh, swampland, or other natural terrain' (except any registered motorboat or any vehicle used for emergency purposes). Unless otherwise provided by statute, any time there is a proposal to allow a motor vehicle meeting this description to be used in a park, the provisions of the EO must be applied."

"Within the National Park System, routes and areas may be designated for off- road motor vehicle use only by special regulation, and only when it would be consistent with the purposes for which the park unit was established. Routes and areas may be designated only in locations in which there will be no adverse impacts on the area's natural, cultural, scenic, and esthetic values, and in consideration of other visitor uses. The criteria listed in section 8.2 [set out above] must also be applied to determine

whether off- road vehicle use may be allowed. As required by the EO and the Organic Act, superintendents must immediately close a designated off- road vehicle route whenever the use is causing, or will cause, unacceptable adverse effects on the soil, vegetation, wildlife, wildlife habitat, or cultural or historic resources."

8.2.3.2 Snowmobiles

"Snowmobile use is a form of off- road vehicle use governed by EO 11644 as amended by EO 11989) and, in Alaska, by provisions of ANILCA (16 USC 3121 and 3170). Implementing regulations are published at 36 CFR 2.18, 36 CFR Park 13, and 43 CFR Part 36."

"NPS administrative use of snowmobiles will be limited to what is necessary to manage public use of snowmobile routes and areas; to conduct emergency operations; and to accomplish essential maintenance, construction, and resource protection activities that cannot be accomplished reasonably by other means."

U.S. Department of the Interior Memoranda

February 17, 2004, memorandum from Assistant Secretary, Fish and Wildlife and Park, to Director, National Park Service.

"…it has become clear that a service- wide directive to prohibit all forms of recreational snowmobile use in the National Park System is no longer warranted and that, with requirements for monitoring and increased use of newer technology snowmobiles, recreational uses can continue to be a part of the NPS winter experience. This will also allow decisions to be made on a park- by- park basis, relying on the professional judgment of each parks' staff. They will be able to consider the lessons from Yellowstone, such as the use of Best Available Technology requirements, guiding requirements, and adaptive management, as well as overall technological improvements and any other new information, and will then be able to determine whether any review or revision of their special regulations is needed."

"Existing road grooming serves an important and sometimes essential role in guaranteeing winter access for both visitors and park staff. It is necessary not only for the operation of recreational snowmobiles, but also for snowcoaches and for snowmobile use by park staff. In some parks, eliminating road grooming would eliminate motorized access to many popular and developed areas. It would not necessarily serve the needs of most visitors or park staff, if it becomes necessary to walk, snowshoe, or cross- country ski over dozens of miles of ungroomed snow- covered roads or trails to reach such areas. Park staff need to retain the flexibility to address these issues in their parks and make decisions regarding park resources, visitor needs, and administrative access needs."

"NPS also needs to lead by example when purchasing and operating snowmobiles for administrative purposes. Only snowmobiles that meet the BAT standards as outlined in the Winter Use SEIS should be used by the NPS for administrative purposes. All purchases of snowmobiles by NPS units must be limited to BAT- compliant models unless a justification for an exception based on operational needs is approved by the respective Regional Director. No approval of a non- BAT machine may be made on the grounds of cost. Parks with employees who reside in the park during the winter months and use snowmobiles as a means of travel on and off duty should also develop a policy that promotes the use of BAT- compliant snowmobiles for these types of uses.

Superintendents should encourage their employees, especially new hires, to use BAT-compliant personal snowmobiles as well. Through a deliberate process of converting to cleaner and quieter snowmobiles, the NPS can be the leader in reducing impacts to our national parks."

"Park superintendents with continued snowmobile use need to do some form of monitoring as outlined in Executive Orders 11644 and 11989. This kind of use must continue to be a part of an active monitoring program and impacts of the use must be assessed from time to time. The appropriate level of monitoring must be tailored to the actual level of use in a park, as determined by the superintendent and park staff. Park officials should use their best professional judgment in determining the level of monitoring that is required."

CHAPTER II: ALTERNATIVES

INTRODUCTION

This chapter presents a detailed description of five alternatives for winter visitor use in Yellowstone National Park, Grand Teton National Park (GTNP) and the John D. Rockefeller, Jr., Memorial Parkway (the Parkway; collectively, the parks). Alternative 1 would prohibit recreational snowmobiling in the parks. The other four alternatives (2, 3, 4, and 5) are limited to actions that would allow snowmobile recreation to continue in the parks. The NPS preferred alternative is alternative 4. The environmentally preferred alternative is alternative 1.

All alternatives considered in this EA must meet the stated purpose and need for action (see Chapter I). Each alternative was formulated as a possible way of meeting the desired conditions in the parks while minimizing impacts to park resources. In accordance with the National Environmental Policy Act (NEPA), alternatives are presented in a comparative form and mitigation measures are described.

All five alternatives meet the purposes and need for this EA. However, alternative 1 would offer a more limited range of visitor experiences in the winter and the opportunity for more limited monitoring data, as compared to the other alternatives. Alternatives 2 - 4 offer a greater range of opportunities for visitors. Use levels in alternative 5 may discourage non- motorized winter visitors, and some of alternative 5's impacts are estimated to be major and adverse (as disclosed in the SEIS).

This EA is intended to guide winter use management for an interim period, pending the completion of a long- term analysis of the effects of winter use in the parks.

ALTERNATIVES DISMISSED FROM FURTHER CONSIDERATION

CLOSURE OF PARK ROADS TO GROOMING

None of the alternatives in this EA change the NPS practice with respect to road grooming. Road grooming has occurred in Yellowstone National Park since the early 1970s and is necessary for park administrative purposes. This EA is intended to apply only to public recreational winter use of the parks and NPS administrative uses are specifically exempted from this EA. Road grooming is also necessary to allow public recreational uses. Since halting road grooming would prevent much of Yellowstone's world- renowned destinations from being accessible to most of the public, it is not consistent with the purpose and need of this EA.

The science surrounding the issue of the effects of groomed roads on bison and elk is currently unclear. Experts disagree about how groomed roads affect, if at all, bison distribution and abundance. The NPS is in the midst of several scientific studies, including a report by Dr. Cormack Gates of the University of Calgary, to review the effects of groomed roads on bison and elk. These studies are summarized in Chapter 3, Additional Topics Dismissed in this EA. The

results of these studies will not be available prior to the start of the 2004- 2005 winter season. Once these studies are completed, NPS will conduct a long- term analysis to fully evaluate the effects of groomed roads on bison and elk. This long- term analysis is expected to result in a permanent regulation on winter use in the parks. Given the scientific uncertainty surrounding these complex ecological issues, an end to the long- standing practice of road grooming is not warranted at this time, as this would effectively close much of the park to visitors, thereby preventing the NPS from allowing for the public to experience and enjoy many of the park's most significant resources. In addition, an end to road grooming would interfere with the NPS' ability to administer the park and adequately protect vital park resources. Instead the NPS has chosen to undertake further analysis and reviews of the scientific information concerning the effects of road grooming on bison and elk, rather than the resorting to the dramatic action of closing the park to road grooming. Therefore, this alternative was dismissed from further consideration.

ACTIONS AND ASSUMPTIONS COMMON TO ALL ALTERNATIVES

- None of the actions proposed under any alternative preclude closures for safety, resource protection, or other reasons as identified in 36 CFR 1.5 or 2.18.
- Solely for the purposes of describing the alternatives in this EA, the following definitions apply:
    - **Oversnow motor vehicles:** self- propelled vehicles intended for travel on snow, driven by a track or tracks in contact with the snow, and which may be steered by skis or tracks in contact with the snow. This term includes both snowmobiles and snowcoaches.
    - **Snowmobiles:** self- propelled vehicles intended for travel on snow, with a curb weight of not more than 1,000 pounds (450 kg), driven by a track or tracks in contact with the snow, and which may be steered by a ski or skis in contact with the snow. (The EPA definition is: "A vehicle designed to operate outdoors only over snow-covered ground, with a maximum width of 1.5 meters.")
    - **Snowplanes:** self- propelled vehicles intended for oversnow travel, weighing not more than 1,000 pounds (450 kg), mounted on skis in contact with the snow, and driven by a pusher- propeller.
    - **Snowcoaches:** self- propelled, mass transit vehicles intended for travel on snow, with a curb weight of over 1,000 pounds (450 kg), driven by a track or tracks, steered by skis or tracks, and that have a capacity of at least 8 passengers.
    - **Gateway communities:** the towns of Jackson and Cody, Wyoming, and Gardiner and West Yellowstone, Montana.

- If the EPA adopts standards for any class of oversnow vehicle that are more stringent than the requirements resulting from this NEPA process and decision, the EPA standards will become the NPS standard for all oversnow vehicles entering the parks.
- The alternatives call for the use of sand, or an equally environmentally neutral substance, for traction on all plowed winter roads. No salts will be used. Before spring opening, sand removal operations will continue to be conducted on all plowed park roads.
- All alternatives would continue to implement transition and action plans for accessibility and support the philosophy of universal access in the parks. The NPS will make reasonable efforts to ensure accessibility to buildings, facilities, programs, and services. The NPS will

develop strategies to ensure that new and renovated facilities, programs, and services (including those provided by concessionaires) are designed, constructed, or offered in conformance with applicable policies, rules, regulations, and standards, including but not limited to the Architectural Barriers Act of 1968, the Americans with Disabilities Act of 1990, the Uniform Federal Accessibility Standards of 1984, and the Guidelines for Outdoor Developed Areas of 1999. The NPS will evaluate existing buildings and existing and new programs, activities, and services, including telecommunications and media, to determine current accessibility and usability by disabled winter visitors. Action plans to remove barriers will be developed.

- Backcountry non- motorized use will continue to be allowed throughout the parks except where designated otherwise.
- The winter use season will last from mid- December to mid- March.
- The speed limit from the West Entrance to Madison to Old Faithful will be maintained at 35 mph except where set at 25 mph in designated segments along this or other roads to protect wildlife and natural soundscapes, and to enhance visitor safety.
- Motorized travel from 9 P.M. to 7 A.M. will continue to be prohibited except when approved by the superintendent for administrative or emergency purposes, or by special permit for necessary travel.
- Under all alternatives there would be no limit on the number of snowcoaches that may enter the parks each day for the duration of this interim EA. However, snowcoach limits are set through concessions contracts.

MONITORING

Scientific studies and monitoring of winter visitor use and park resources (including air quality, natural soundscapes, wildlife, employee health and safety, water quality, and visitor experience) will continue. Selected areas of the park, including sections of roads, may be closed to visitor use if scientific studies indicate that human presence or activities have unacceptable effects on wildlife or other park resources that could not otherwise be mitigated. The appropriate level of environmental assessment under NEPA will be completed for all actions as required by Council on Environmental Quality regulations (40 CFR parts 1500–1508).

- A one- year notice will be provided before any such closure would be implemented unless immediate closure is deemed necessary to avoid impairment of park resources.
- Due to the temporary nature of this EA, it would be impractical to implement the adaptive management provisions of the SEIS and the December 11, 2003, final rule. Most non-emergency changes in park management implemented under the adaptive management framework would have been implemented only after at least one or two years of monitoring, followed by a 6- to 12- month notification and waiting period. The superintendent will continue to have the authority under 36 CFR 1.5 to take emergency actions to protect park resources or values.

SNOWMOBILE BEST AVAILABLE TECHNOLOGY (BAT)

- The superintendent will maintain a list of approved snowmobile makes, models, and years of manufacture that meet BAT requirements.
- The NPS expects that snowmobile manufacturers will conduct research to continually improve sound and emissions in available machines. Information on the full spectrum of pollutant criteria is critical as BAT is implemented to prevent an inadvertent increase in some

pollutants. Without continuous improvement, the initial generation of machines may not meet BAT requirements over time, requiring the imposition of other control measures such as reduced snowmobile numbers.

- For the alternatives that include snowmobile BAT requirements (2 to 5), the following emission standards would apply.

  Snowmobile BAT Air Emissions Requirements
  - All snowmobiles must achieve a 90% reduction in hydrocarbons and a 70% reduction in carbon monoxide emissions, relative to EPA's baseline emissions assumptions for conventional two- stroke snowmobiles. Specifically, beginning with the 2005 model year (snowmobiles available in fall 2004), all snowmobiles must be certified under 40 CFR 1051 to a Family Emission Limit no greater than 15 g/kW- hr for hydrocarbons and 120 g/kW- hr for carbon monoxide.
  - For 2004 model year snowmobiles, measured emissions levels (official emission results with no deterioration factors applied) must comply with the emission limits specified above.
  - Pre- 2004 model year snowmobiles may be operated only if they have been shown to have emissions that do not exceed the limits specified above.
  - Snowmobiles must be tested on a five- mode engine dynamometer, consistent with the test procedures specified by EPA (40 CFR 1051 and 1065).

  Snowmobile BAT Sound Requirements
  - Snowmobiles must operate at or below 73dBA as measured at full throttle according to Society of Automotive Engineers J192 test procedures (revised 1985). Snowmobiles may be tested at any barometric pressure equal to or above 23.4 inches Hg uncorrected (as measured at or near the test site).

- Snowmobiles that have been modified in a manner that may affect air or sound emissions may be prohibited by the superintendent.

SNOWCOACH BAT REQUIREMENTS

- Beginning in the 2005–2006 season, all snowcoaches must meet BAT air emission requirements, which will be the EPA emissions standards in effect when the vehicle was manufactured. This will be enforced by ensuring that all critical emission- related exhaust components are functioning properly. Malfunctioning critical emissions- related components must be replaced with the original equipment manufacturer (OEM) component where possible. If OEM parts are not available, aftermarket parts may be used. In general, catalysts that have exceeded their useful life must be replaced unless the operator can demonstrate the catalyst is functioning properly.
- Because this EA is only intended to guide winter use management for an interim period (up to three winter seasons), sound emissions requirements are not included in this analysis. The December 11, 2003, regulation (now vacated), required all snowcoaches used in the parks to meet sound emission of no greater than 75dBA beginning in the 2008–2009 season, when measured at 50 feet at 25 mph. This requirement is mentioned here to let snowcoach operators know NPS expectations regarding possible future requirements for snowcoaches.

WATER RESOURCES

- Best management practices will be used during the construction, reconstruction, or winter plowing of trails and roads to prevent unnecessary vegetation removal, erosion, and sedimentation.
- Any new or reconstructed winter use sanitary facilities will be constructed in locations and with advanced technologies that will protect water resources.
- A focused monitoring program will reduce the uncertainty of impacts from oversnow vehicles, and if necessary indicate best management practices that might be implemented.

WILDLIFE, INCLUDING FEDERALLY PROTECTED SPECIES AND SPECIES OF SPECIAL CONCERN

- The NPS will investigate and implement options to reduce the palatability and accessibility of the hydraulic fluid used in snow groomers to wildlife.
- At periodic intervals when snow depth warrants, routine plowing operations will include laying back roadside snow banks that could be a barrier to wildlife exiting the road corridor.
- NPS personnel will patrol sensitive resources to ensure compliance with area closures.
- The parks will continue to support the objectives of the Greater Yellowstone Bald Eagle Management Plan, and the eagle population will continue to be monitored to identify and protect nests.
- Monitoring of wolf population will continue.
- Lynx surveys have been completed and there are no plans for further lynx surveys at this time. We will continue to consult with the U.S. Fish and Wildlife Service based on information gathered during the survey.
- Assessment of grizzly bear abundance, distribution, and habitat selection, including the location of dens, will continue. The information obtained will assist park managers in protecting important habitats and planning recreational activities that minimize disturbance to bears. Monitoring grizzly bear populations will continue in accordance with the Interagency Grizzly Bear Management Guidelines and the parks' bear management plans.
- Monitoring and protecting trumpeter swan habitats and nests will continue, including the closure of nest sites to public access when warranted.
- Monitoring potential or known winter use conflicts will result in area closures if necessary to protect wildlife habitat.
- Use of groomed, ungroomed, and plowed surfaces by bison and other ungulates will continue to be monitored.

CULTURAL RESOURCES

- If human remains, funerary objects, sacred objects, or objects of cultural patrimony are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act of 1990 (25 USC 3001) will be followed.
- Trails and trailheads will be sited to avoid adversely impacting known cultural resources, including potential cultural landscapes. In addition, natural materials and colors will be used so that any permanent signs erected will blend into their surroundings.

ADMINISTRATIVE SNOWMOBILE USE

- All of the alternatives allow the non- recreational, administrative use of snowmobiles by park personnel or parties duly permitted under the provisions of 36 CFR 1.5 and 1.6. Permitted parties must meet technological requirements for cleaner and quieter machines.
- Administrative use of snowmobiles may be supplemented with administrative snowcoaches, subject to available funding and authority. When administrative snowmobiles are necessary, the NPS will use BAT snowmobiles where possible. Non- BAT snowmobiles will be permitted for law enforcement, search and rescue, and other administrative purposes requiring additional horsepower.
- Employees and their families living in the interior of Yellowstone may continue to use snowmobiles. This use will not count against daily recreational entry limits and will not be subject to guiding requirements. Subject to available funding, the NPS will provide administrative snowcoaches for employee use and implement programs to replace employee snowmobiles with ones that meet BAT requirements.
- Concessionaires will be allowed limited use of snowmobiles for administrative purposes. To the extent practicable (through permits and contracts), concessioners will be required to use BAT snowmobiles and encouraged to use snowcoaches. This use will not count against daily recreational entry limits.

ACTIONS SPECIFIC TO YELLOWSTONE

- In Yellowstone, the NPS will continue to plow the road from Mammoth to Tower and Tower to the Northeast Entrance (Cooke City) throughout the winter, and support the State of Montana's plowing of U.S. Highway 191 in Yellowstone.
- A designated "non- motorized recreation" route is defined as a marked or otherwise indicated oversnow travel route.
- Sensitive areas within the inner gorge of the Grand Canyon of the Yellowstone and the McMinn Bench bighorn sheep area will continue to be closed to recreational winter use.
- Non- motorized recreational use in wildlife winter ranges and thermal areas will be restricted to designated routes or trails.
- Wildlife- proof winter garbage storage facilities will be constructed in the Old Faithful, Grant, Lake, and Canyon areas.
- Interpretative programs on the unique aspects of the winter environment will be provided at destination areas and warming huts and through guided tours for organized groups on snowcoaches, and interpretive ski and snowshoe tours and programs near areas such as Tower, Canyon, Mammoth, Old Faithful, West Thumb, Madison, and the West Entrance.
- Warming huts will be available for all visitors at Old Faithful, Norris, Madison, Canyon, Fishing Bridge, Mammoth Terraces, and other appropriate sites.
- Avalanche control will continue at Sylvan Pass and other locations, but the program will be modified on a pilot basis during the implementation of the Temporary Winter Use Plan to address some safety concerns. Helicopter- dispensed explosives will be used in addition to the howitzer on Sylvan Pass during at least the first winter of the pilot program. Depending on the success of the helicopter- based program, use of the howitzer may be phased out. Helicopter- dispensed explosives are expected to be used about 10 times per winter, approximately as frequently as howitzer control. Helicopters are used for avalanche control along highways and in ski areas elsewhere in the United States. Avalanche control on Sylvan Pass may require unscheduled closures of the road to all travel for extended periods of time.

Depending on weather and snow conditions, safe travel may not be achieved for several days, regardless of whether howitzers or helicopters are used.

ACTIONS SPECIFIC TO GRAND TETON AND THE PARKWAY

- In GTNP and the Parkway, the following roads will continue to be plowed:
    - Highway 26/89/287 from the south boundary of GTNP to Moran.
    - Highway 89/287 from Moran to Flagg Ranch.
    - Highway 26/287 from Moran to the east boundary of GTNP.
    - Teton Park Road from Moose Junction to Taggart Lake Trailhead, and from Jackson Lake Junction to Signal Mountain Lodge; the Pacific Creek Road, from Highway 89/287 to the GTNP boundary; from Kelly to the east park boundary; from Gros Ventre Junction to Kelly to Mailbox Corner; the road to the east park boundary at Ditch Creek; the Moose–Wilson Road from the Granite Canyon Entrance to the Granite Canyon Trailhead, and from Moose to at least the Death Canyon Trailhead Road junction.

- Current winter closures will remain in effect on the Snake River floodplain, the Buffalo Fork River floodplain, and the Uhl Hill area, Willow Flats, Kelly Hill, Static Peak, Prospectors Mountain, and Mount Hunt.
- Motorized access to inholdings and adjacent public and private lands will continue to be available through a combination of plowed roads for wheeled- vehicles and staging areas for snowmobiles traveling to immediately adjacent lands.
- Reasonable and direct access to adjacent public and private lands, or to privately owned lands within the park with permitted or historical motorized access, will continue via paved and plowed routes or via oversnow routes from GTNP.
- Interpretative programs on the unique aspects of the winter environment will be provided at destination areas and warming huts and through guided tours for organized groups on snowcoaches, and interpretive ski and snowshoe tours and programs at locations such as Moose, Colter Bay, and Flagg Ranch visitor services.
- Snowmobiles that meet the best available emission and sound limits will be phased in for administrative use, subject to available funding.
- Destination and support facilities will continue to be provided at Moose, Triangle X, Colter Bay, and Flagg Ranch, and warming hut facilities will be available along the Teton Park Road to provide visitor services and interpretive opportunities that focus on non- motorized uses (zone 1).

THE NO ACTION ALTERNATIVE

The “no action” alternative is a required feature in an environmental assessment or environmental impact statement. It is usually described as continuing the present management actions. It may set a baseline of existing impacts against which to compare the affects of other alternatives. This helps set a context for determining the relative magnitude and intensity of impacts.

At present, the identification of a no action alternative is uncertain, therefore several alternatives are being treated as no action for the purpose of this EA. A complicating factor in determining the no action alternative for this EA is the uncertain outcome of the proceedings in separate U.S. District Courts, which may result in several possible no action alternatives. One no action alternative could be the snowcoach- only alternative. This was the no action alternative in the SEIS, and it is incorporated as alternative 1 in this EA. It was also the alternative selected by the NPS in the 2000 winter use plan and 2001 implementing regulations.

A second no action alternative would be to continue the park superintendents' compendia that were amended in February 2004 following the February 10, 2004, decision by the U.S. District Court for the District of Wyoming. As of the writing of this EA, neither the February 10, 2004, injunction has been formally dissolved, nor have the compendia amendments been rescinded. Alternative 4 in this EA most closely matches the provisions of the superintendents' compendia amendments.

A third no action alternative would be to adhere to the 1983 regulations that governed snowmobile use in the parks prior to promulgation of the 2001 regulations. The regulations are supported by the 1990 winter use plan and environmental assessment. They restrict snowmobile use to designated routes in the parks. However, the 1983 regulations describe a type and amount of snowmobile use that was found to constitute impairment of park resources and values in the 2000 EIS and the 2003 SEIS. This alternative may not be legally permissible and thus does not meet the purpose and need's criteria for detailed consideration in this EA. However, comparisons are made throughout this EA between the alternatives and the historical conditions represented by the 1983 regulations. Thus the reader can compare the different alternatives with regulated and managed snowmobile use (or snowcoaches only) with the historical use levels and vehicle types.

ALTERNATIVE 1

Alternative 1 is similar to full implementation of the snowcoach- only provisions of the November 2000 Record of Decision and January 22, 2001, regulation.

ACTIONS AND ASSUMPTIONS COMMON TO ALL PARKS

- By an affirmative commitment, the NPS would implement strategies designed to provide a reasonable level of affordable winter access to park visitors.
- All snowcoaches operating in the park would be required to be operated in accordance with a concessions contract, incidental business permit, or other NPS- issued permit.

ACTIONS SPECIFIC TO YELLOWSTONE

Routes Open to Snowcoach Use

- Grand Loop Road from its junction with Terrace Springs Drive to Norris Junction.
- Norris Junction to Canyon Junction.
- Grand Loop Road from Norris Junction to Madison Junction.
- West Entrance Road from the park boundary at West Yellowstone to Madison Junction.
- Grand Loop Road from Madison Junction to West Thumb.

- South Entrance Road from the South Entrance to West Thumb.
- Grand Loop Road from West Thumb to its junction with the East Entrance Road.
- East Entrance Road from the East Entrance to its junction with the Grand Loop Road.
- Grand Loop Road from its junction with the East Entrance Road to Canyon Junction.
- South Canyon Rim Drive.
- Lake Butte Road.
- Firehole Canyon Drive.
- Fountain Flat Road.
- Virginia Cascades Drive.
- North Canyon Rim Drive.
- Riverside Drive.
- Grand Loop Road from Canyon Junction to the Washburn Hot Springs overlook.
- In the developed areas of Madison Junction, Old Faithful, Grant Village, Lake, Fishing Bridge, Canyon, Indian Creek, and Norris.

The superintendent may open or close these oversnow routes, or portions thereof, or designate new routes for snowcoach travel after taking into consideration the location of wintering wildlife, appropriate snow cover, public safety, and other factors. Notice of such opening or closing will be provided by one or more of the methods listed in 36 CFR 1.7(a).

ACTIONS SPECIFIC TO GRAND TETON AND THE PARKWAY

Routes Open to Snowcoach Use

- Along U.S. Highway 89/287 from the Snake River Bridge to the north boundary of the Parkway.

The superintendent may open or close this oversnow route, or portions thereof, or designate new routes for snowcoach travel after taking into consideration the location of wintering wildlife, appropriate snow cover, public safety, and other factors. Notice of such opening or closing will be provided by one or more of the methods listed in 36 CFR 1.7(a).

ALTERNATIVE 2

Alternative 2 is intended replicate the visitation pattern and conditions that occurred during the 2003–2004 season. It would use a combination of measures to mitigate impacts on air quality, natural soundscapes, employee and visitor health and safety, wildlife, and visitor experience while allowing for snowmobile use. It would allow up to 318 snowmobiles per day in Yellowstone and 50 per day in GTNP and the Parkway combined, with the requirements that all snowmobiles use BAT and all snowmobilers in Yellowstone travel with a commercial guide.

It would be impossible to exactly replicate the visitation pattern that occurred during the 2003–2004 season unless the daily entry limit changed every day (e.g., a limit of 341 for December 28, 219 for February 1, etc.). Such daily entry limits would be extremely impractical to implement and extraordinarily confusing to visitors. However, instituting a daily limit of 318 snowmobiles in Yellowstone and 50 in GTNP and the Parkway combined will result in slightly more than the average daily number of snowmobiles that entered Yellowstone last year (262 for January and February), and less than the number that entered the park on its peak day (438). Thus, this

alternative would accommodate the average 2003–2004 visitation while eliminating peak day use in excess of 318 snowmobiles. Similar to the first portion of the 2003–2004 season, Alternative 2 does not allow snowmobiles on Jackson Lake.

Actions and Assumptions Common to All Parks

- All recreational snowmobiles operating in the parks must meet BAT requirements as described earlier in this chapter.
- Snowmobiles starting in the Targhee National Forest and traveling on the Grassy Lake Road to Flagg Ranch would be exempt from BAT requirements. However, these snowmobiles may not travel further into the Parkway unless they meet BAT requirements and any other applicable requirements.
- Since this EA is only intended to guide winter use management in the parks for an interim period, all three park units would be open to snowmobiling through the winter of 2006–2007 unless new regulations were promulgated in regard to snowmobile use.

Actions Specific to Yellowstone

- No more than 11 snowmobiles would be permitted in a group, including the commercial guide's sled.

Routes Open to Snowmobile Use through the Winter of 2006–2007

- Grand Loop Road from its junction with Terrace Springs Drive to Norris Junction.
- Norris Junction to Canyon Junction.
- Grand Loop Road from Norris Junction to Madison Junction.
- West Entrance Road from the park boundary at West Yellowstone to Madison Junction.
- Grand Loop Road from Madison Junction to West Thumb.
- South Entrance Road from the South Entrance to West Thumb.
- Grand Loop Road from West Thumb to its junction with the East Entrance Road.
- East Entrance Road from the East Entrance to its junction with the Grand Loop Road.
- Grand Loop Road from its junction with the East Entrance Road to Canyon Junction.
- South Canyon Rim Drive.
- Lake Butte Road.
- In the developed areas of Madison Junction, Old Faithful, Grant Village, Lake, Fishing Bridge, Canyon, Indian Creek, and Norris.

The superintendent may open or close these oversnow routes, or portions thereof, or designate new routes for snowcoach travel after taking into consideration the location of wintering wildlife, appropriate snow cover, public safety, and other factors. Notice of such opening or closing will be provided by one or more of the methods listed in 36 CFR 1.7(a).

Routes Open to Snowcoach Use

- All routes designated for snowmobile use would also be open to snowcoach use.
- In addition, the following routes would be open only to snowcoaches:
    - Firehole Canyon Drive.
    - Fountain Flat Road.
    - Virginia Cascades Drive.
    - North Canyon Rim Drive.

- Riverside Drive.
- Grand Loop Road from Canyon Junction to the Washburn Hot Springs overlook.

The superintendent may open or close these oversnow routes, or portions thereof, or designate new routes for snowcoach travel after taking into consideration the location of wintering wildlife, appropriate snow cover, public safety, and other factors. Notice of such opening or closing will be provided by one or more of the methods listed in 36 CFR 1.7(a).

Guiding Requirements

- All snowmobilers in Yellowstone would be required to travel with a commercial guide.
- All businesses providing commercial guiding services in the park would be required to have permits authorizing their operation.
- All snowcoaches operating in the park would have to be operated in accordance with a concessions contract, incidental business permit, or other NPS- issued permit.

Table 1. Alt. 2. Yellowstone National Park daily snowmobile entry limits.

Entrance	Commercially Guided Snowmobiles	Unguided Snowmobiles	Total
West Entrance	160	-	160
South Entrance	121	-	121
East Entrance	22	-	22
North Entrance	15	-	15
Old Faithful	0	-	0
Total	**318**	**-**	**318**

ACTIONS SPECIFIC TO GRAND TETON AND THE PARKWAY

Routes Open to Snowmobile Use through the Winter of 2006–2007

- The Continental Divide Snowmobile Trail (CDST) along U.S. 26/287 from the east boundary of GTNP to Moran Junction, and along U.S. 89/287 from Moran Junction to the north boundary of GTNP.
- The CDST along U.S. Highway 89/287 from the south boundary of the Parkway north to the Snake River Bridge.
- U.S. Highway 89/287 from the Snake River Bridge to the north boundary of the Parkway.
- Grassy Lake Road from Flagg Ranch to the west boundary of the Parkway.

The superintendent may open or close these oversnow routes, or portions thereof, or designate new routes for snowcoach travel after taking into consideration the location of wintering wildlife, appropriate snow cover, public safety, and other factors. Notice of such opening or closing will be provided by one or more of the methods listed in 36 CFR 1.7(a).

Routes Open to Snowcoach Use

- Along U.S. Highway 89/287 from the Snake River Bridge to the north boundary of the Parkway.

The superintendent may open or close this oversnow route, or portions thereof, or designate new routes for snowcoach travel after taking into consideration the location of wintering

wildlife, appropriate snow cover, public safety, and other factors. Notice of such opening or closing will be provided by one or more of the methods listed in 36 CFR 1.7(a).

Guiding Requirements

- Snowmobile guides would not be required in GTNP or the Parkway.
- All snowcoaches operating in the Parkway would have to be operated in accordance with a concessions contract, incidental business permit, or other NPS- issued permit.

Table 2. Alt. 2. Grand Teton and the Parkway daily snowmobile entry limits.

Entrance	Commercially Guided Snowmobiles	Unguided Snowmobiles	Total
CDST	0	25	25
Grassy Lake Road (Flagg-Ashton Road)	0	25	25
Jackson Lake	0	0	0
Total	**0**	**50**	**50**

ALTERNATIVE 3

This alternative would also use a combination of measures to mitigate impacts on air quality, natural soundscapes, employee and visitor health and safety, wildlife, and visitor experience while allowing for snowmobile use. It would allow up to 540 snowmobiles per day in Yellowstone and 75 in GTNP and the Parkway, with the requirement that all snowmobiles use BAT and snowmobilers in Yellowstone travel with a commercial guide. However, beginning in the 2005–2006 season, slightly less than 20% of the daily snowmobile entries would be allocated for unguided snowmobiles, which would be required to enter Yellowstone before 10:30 A.M each day.

ACTIONS AND ASSUMPTIONS COMMON TO ALL PARKS

- All recreational snowmobiles operating in the parks must meet BAT requirements as described earlier in this chapter.
- Snowmobiles starting in the Targhee National Forest and traveling on the Grassy Lake Road to Flagg Ranch would be exempt from BAT requirements. However, these snowmobiles may not travel further into the Parkway unless they meet BAT requirements and any other applicable requirements.
- Since this EA is only intended to guide winter use management in the parks for an interim period, all three park units would be open to snowmobiling through the winter of 2006–2007 unless new regulations were promulgated in regard to snowmobile use.

ACTIONS SPECIFIC TO YELLOWSTONE

- No more than 11 snowmobiles would be permitted in a group (including the commercial guide's sled, if applicable).

Routes Open to Snowmobile Use through the Winter of 2006–2007

- Grand Loop Road from its junction with Terrace Springs Drive to Norris Junction.
- Norris Junction to Canyon Junction.
- Grand Loop Road from Norris Junction to Madison Junction.
- West Entrance Road from the park boundary at West Yellowstone to Madison Junction.
- Grand Loop Road from Madison Junction to West Thumb.
- South Entrance Road from the South Entrance to West Thumb.
- Grand Loop Road from West Thumb to its junction with the East Entrance Road.
- East Entrance Road from the East Entrance to its junction with the Grand Loop Road.
- Grand Loop Road from its junction with the East Entrance Road to Canyon Junction.
- South Canyon Rim Drive.
- Lake Butte Road.
- In the developed areas of Madison Junction, Old Faithful, Grant Village, Lake, Fishing Bridge, Canyon, Indian Creek, and Norris.

The superintendent may open or close these routes, or portions thereof, for snowmobile travel after taking into consideration the location of wintering wildlife, appropriate snow cover, public safety, and other factors. Notice of such opening or closing will be provided by one or more of the methods listed in 36 CFR 1.7(a).

Routes Open to Snowcoach Use

- All routes designated for snowmobile use would also be open to snowcoach use.
- In addition, the following routes would be open only to snowcoaches:
    - Firehole Canyon Drive.
    - Fountain Flat Road.
    - Virginia Cascades Drive.
    - North Canyon Rim Drive.
    - Riverside Drive.
    - Grand Loop Road from Canyon Junction to the Washburn Hot Springs overlook.

The superintendent may open or close these oversnow routes, or portions thereof, or designate new routes for snowcoach travel after taking into consideration the location of wintering wildlife, appropriate snow cover, public safety, and other factors. Notice of such opening or closing will be provided by one or more of the methods listed in 36 CFR 1.7(a).

Guiding Requirements

- During the 2004–2005 season, all snowmobilers in Yellowstone would be required to travel with a commercial guide. All businesses providing commercial guiding services in the park would be required to have permits authorizing their operation.
- Beginning in 2005–2006 season, slightly less than 20% of the daily snowmobile entries would be allocated for unguided snowmobiles (see Table 9, Summary of Alternatives, at the end of this chapter). This phase- in is needed to effectively implement the reservation system for unguided snowmobiles.
- Yellowstone would administer the program for unguided snowmobiles by issuing one or more management and operations contracts to oversee a reservation and orientation system to help assure that all requirements such as BAT, group size, etc., are met.
- When they receive their entrance passes, all park visitors on unguided snowmobiles would be required to attend a short presentation on safety, how to minimize impacts to the park, snowmobile riding etiquette, park regulations, and how to avoid disturbances to wildlife.

This presentation could be given by a park ranger or concessions employee in person or on video.
- All snowcoaches operating in the park would have to be operated in accordance with a concessions contract, incidental business permit, or other NPS- issued permit.

Snowmobile Timed Entry Requirements

- To protect natural soundscapes and enhance visitor experience, unguided snowmobilers would be required to enter the park by no later than 10:30 A.M. This entry requirement could be adjusted if park roads or entrances were closed due to weather conditions, avalanche control, or other circumstances beyond visitors' control.
- Because commercially guided snowmobile trips routinely enter the park before 10:30 A.M., they would not have an entry time requirement.

Table 3. Alt. 3. Yellowstone National Park daily snowmobile entry limits.

Entrance	Commercially Guided Snowmobiles	Unguided Snowmobiles, Winters of 2005–2006 and 2006–2007[1]	Total
West Entrance	240	50	290
South Entrance	121	25	146
East Entrance	40	10	50
North Entrance	22	10	32
Old Faithful	22	0	22
Total	**445**	**95**	**540**

[1] During the winter of 2003–2004, all of the daily permitted snowmobile entries would be allocated to commercial guides.

ACTIONS SPECIFIC TO GRAND TETON AND THE PARKWAY

Routes Open to Snowmobile Use through the Winter of 2006–2007

- The Continental Divide Snowmobile Trail (CDST) along U.S. 26/287 from the east boundary of GTNP to Moran Junction, and along U.S. 89/287 from Moran Junction to the north boundary of GTNP.
- The CDST along U.S. Highway 89/287 from the south boundary of the Parkway north to the Snake River Bridge.
- U.S. Highway 89/287 from the Snake River Bridge to the north boundary of the Parkway.
- Grassy Lake Road from Flagg Ranch to the west boundary of the Parkway.
- The frozen surface of Jackson Lake for purposes of ice fishing by persons who possess a valid Wyoming state fishing license and the proper fishing gear. Jackson will be open generally from the time that the ice reaches sufficient thickness to make the lake safe for snowmobile use. The season will extend until late March or early April, depending on lake conditions, public safety, and resource concerns.

The superintendent may open or close these routes, or portions thereof, for snowmobile travel and may establish separate zones for motorized and non- motorized use on Jackson Lake, after taking into consideration the location of wintering wildlife, appropriate snow cover, public safety and other factors. Notice of such opening or closing will be provided by one or more of the methods listed in 36 CFR 1.7(a).

Routes Open to Snowcoach Use

- U.S. Highway 89/287 from the Snake River Bridge to the north boundary of the Parkway.

The superintendent may open or close this oversnow route, or portions thereof, or designate new routes for snowcoach travel after taking into consideration the location of wintering wildlife, appropriate snow cover, public safety, and other factors. Notice of such opening or closing will be provided by one or more of the methods listed in 36 CFR 1.7(a).

Guiding Requirements

- Snowmobile guides would not be required in GTNP or the Parkway.
- All snowcoaches operating in the Parkway would have to be operated in accordance with a concessions contract, incidental business permit, or other NPS- issued permit.

Table 4. Alt. 3. Grand Teton and the Parkway daily snowmobile entry limits.

Entrance	Commercially Guided Snowmobiles	Unguided Snowmobiles	Total
CDST	0	25	25
Grassy Lake Road (Flagg-Ashton Road)	0	25	25
Jackson Lake	0	25	25
Total	**0**	**75**	**75**

ALTERNATIVE 4: THE PREFERRED ALTERNATIVE

This alternative would also use a combination of measures to mitigate impacts on air quality, natural soundscapes, employee and visitor health and safety, wildlife, and visitor experience, while allowing for snowmobile use. Specifically, this alternative would allow more snowmobiles than alternatives 2 or 3 (720 per day in Yellowstone and 140 in GTNP and the Parkway combined) with the requirements that all snowmobiles use BAT and all snowmobilers in Yellowstone travel with a commercial guide. This alternative would also open the Firehole Canyon Drive to snowmobiles in the afternoon, while allowing snowcoach visitors the opportunity to view the area in the morning without the presence of snowmobile traffic. Alternative 4 is similar to the superintendents' compendium amendments that were put into place on February 11, 2004, following the order of the Wyoming Federal District Court.

ACTIONS AND ASSUMPTIONS COMMON TO ALL PARKS

- All recreational snowmobiles operating in the parks must meet BAT requirements as described earlier in this chapter.
- Snowmobiles starting in the Targhee National Forest and traveling on the Grassy Lake Road to Flagg Ranch would be exempt from BAT requirements. However, these snowmobiles may not travel further into the Parkway unless they meet BAT requirements and any other applicable requirements.
- Since this EA is only intended to guide winter use management in the parks for an interim period, all three park units would be open to snowmobiling through the winter of 2006–2007 unless new regulations were promulgated in regard to snowmobile use.

ACTIONS SPECIFIC TO YELLOWSTONE

- No more than 11 snowmobiles would be permitted in a group, including the commercial guide's sled.

Routes Open to Snowmobile Use through the Winter of 2006–2007

- Grand Loop Road from its junction with Terrace Springs Drive to Norris Junction.
- Norris Junction to Canyon Junction.
- Grand Loop Road from Norris Junction to Madison Junction.
- West Entrance Road from the park boundary at West Yellowstone to Madison Junction.
- Grand Loop Road from Madison Junction to West Thumb.
- South Entrance Road from the South Entrance to West Thumb.
- Grand Loop Road from West Thumb to its junction with the East Entrance Road.
- East Entrance Road from the East Entrance to its junction with the Grand Loop Road.
- Grand Loop Road from its junction with the East Entrance Road to Canyon Junction.
- South Canyon Rim Drive.
- Lake Butte Road.
- Firehole Canyon Drive, from noon to 9 P.M. only
- In the developed areas of Madison Junction, Old Faithful, Grant Village, Lake, Fishing Bridge, Canyon, Indian Creek, and Norris.

The superintendent may open or close these routes, or portions thereof, for snowmobile travel after taking into consideration the location of wintering wildlife, appropriate snow cover, public safety, and other factors. Notice of such opening or closing will be provided by one or more of the methods listed in 36 CFR 1.7(a).

Routes Open to Snowcoach Use

- All routes designated for snowmobile use are also open to snowcoach use.
- In addition, the following routes are open to snowcoaches:
    - Firehole Canyon Drive all day.
    - Fountain Flat Road.
    - Virginia Cascades Drive.
    - North Canyon Rim Drive.
    - Riverside Drive.
    - Grand Loop Road from Canyon Junction to the Washburn Hot Springs overlook.

The superintendent may open or close these oversnow routes, or portions thereof, or designate new routes for snowcoach travel after taking into consideration the location of wintering wildlife, appropriate snow cover, public safety, and other factors. Notice of such opening or closing will be provided by one or more of the methods listed in 36 CFR 1.7(a).

Guiding Requirements

- All snowmobilers in Yellowstone would be required to travel with a commercial guide.
- All businesses providing commercial guiding services in the park would be required to have permits authorizing their operation.
- All snowcoaches operating in the park would have to operate in accordance with a concessions contract, incidental business permit, or other NPS- issued permit.

Table 5. Alt. 4. Yellowstone National Park daily snowmobile entry limits.

Entrance	Commercially Guided Snowmobiles	Unguided Snowmobiles	Total
West Entrance	400	-	400
South Entrance	220	-	220
East Entrance	40	-	40
North Entrance	30	-	30
Old Faithful	30	-	30
Total	**720**	**-**	**720**

ACTIONS SPECIFIC TO GRAND TETON AND THE PARKWAY

Routes Open to Snowmobile Use through the Winter of 2006–2007

- The Continental Divide Snowmobile Trail (CDST) along U.S. 26/287 from the east boundary of GTNP to Moran Junction, and along U.S. 89/287 from Moran Junction to the north boundary of GTNP.
- The CDST along U.S. Highway 89/287 from the south boundary of the Parkway north to the Snake River Bridge.
- U.S. Highway 89/287 from the Snake River Bridge to the north boundary of the Parkway.
- Grassy Lake Road from Flagg Ranch to the west boundary of the Parkway.
- The frozen surface of Jackson Lake for purposes of ice fishing by persons with a valid Wyoming state fishing license and the proper fishing gear. Jackson will be open generally from the time that the ice reaches sufficient thickness to make the lake safe for snowmobile use. The season will extend until late March or early April, depending on lake conditions, public safety, and resource concerns.

The superintendent may open or close these routes, or portions thereof, for snowmobile travel and may establish separate zones for motorized and non- motorized use on Jackson Lake, after taking into consideration the location of wintering wildlife, appropriate snow cover, public safety and other factors. Notice of such opening or closing will be provided by one or more of the methods listed in 36 CFR 1.7(a).

Routes Open to Snowcoach Use

- Along U.S. Highway 89/287 from the Snake River Bridge to the north boundary of the Parkway.

The superintendent may open or close this oversnow route, or portions thereof, or designate new routes for snowcoach travel after taking into consideration the location of wintering wildlife, appropriate snow cover, public safety, and other factors. Notice of such opening or closing will be provided by one or more of the methods listed in 36 CFR 1.7(a).

Guiding Requirements

- Snowmobile guides would not be required in GTNP or the Parkway.
- All snowcoaches operating in the Parkway would have to be operated in accordance with a concessions contract, incidental business permit, or other NPS- issued permit.

Table 6. Alt. 4. Grand Teton and the Parkway daily snowmobile entry limits.

Entrance	Commercially Guided Snowmobiles	Unguided Snowmobiles	Total
CDST	0	50	50
Grassy Lake Road (Flagg-Ashton Road)	0	50	50
Jackson Lake	0	40	40
Total	**0**	**140**	**140**

ALTERNATIVE 5

Alternative 5 is essentially the same as the preferred alternative in the Final SEIS, as modified by the March 25, 2003, Record of Decision and the December 11, 2003, rule published in the Federal Register.

Alternative 5 would allow 950 snowmobiles per day in Yellowstone and 190 in GTNP and the Parkway combined. Commercial guides would be required for 80% of the daily entries; the balance would be available for "self- guided" parties in which one member has been certified by the NPS to lead a group of snowmobilers. However, to allow time for the NPS to develop the training program for these "non- commercially guided" trips, the remaining 20% may be filled by unguided trips during the winter of 2004–2005 only.

Due to the temporary nature of this EA, further modifications have been made to this alternative. For example, the adaptive management provisions of the SEIS and final rule versions of this alternative would be impractical because this EA is only designed to guide winter use management for a short period. Most non- emergency changes in park management implemented under the adaptive management framework would have been implemented only after at least one or two years of monitoring, followed by a 6- to 12- month notification and waiting period. The superintendent will continue to have the authority under 36 CFR 1.5 to take emergency actions to protect park resources or values.

ACTIONS COMMON TO ALL PARKS

- Beginning with 2004–2005 season, all commercially guided snowmobiles operating in the parks must meet BAT requirements as described earlier in this chapter.
- Beginning with the winter of 2005–2006, all non- commercially guided snowmobiles must meet BAT requirements as described earlier in this chapter.
- Unguided snowmobiles, permitted in Yellowstone only during the winter of 2004–2005, would not have to meet BAT requirements.
- Snowmobiles starting in the Targhee National Forest and traveling on the Grassy Lake Road to Flagg Ranch would be exempt from BAT requirements. However, these snowmobiles may not travel further into the Parkway unless they meet BAT requirements and any other applicable requirements.

- Since this EA is only intended to guide winter use management in the parks for an interim period, all three park units would be open to snowmobiling through the winter of 2006–2007 unless new regulations were promulgated in regard to snowmobile use.

ACTIONS SPECIFIC TO YELLOWSTONE

- No more than 11 snowmobiles would be permitted in a group (including the guide's sled, where applicable).

Routes Open to Snowmobile Use through the Winter of 2006–2007

- Grand Loop Road from its junction with Terrace Springs Drive to Norris Junction.
- Norris Junction to Canyon Junction.
- Grand Loop Road from Norris Junction to Madison Junction.
- West Entrance Road from the park boundary at West Yellowstone to Madison Junction.
- Grand Loop Road from Madison Junction to West Thumb.
- South Entrance Road from the South Entrance to West Thumb.
- Grand Loop Road from West Thumb to its junction with the East Entrance Road.
- East Entrance Road from the East Entrance to its junction with the Grand Loop Road.
- Grand Loop Road from its junction with the East Entrance Road to Canyon Junction.
- South Canyon Rim Drive.
- Lake Butte Road.
- In the developed areas of Madison Junction, Old Faithful, Grant Village, Lake, Fishing Bridge, Canyon, Indian Creek, and Norris.

The superintendent may open or close these routes, or portions thereof, for snowmobile travel after taking into consideration the location of wintering wildlife, appropriate snow cover, public safety, and other factors. Notice of such opening or closing will be provided by one or more of the methods listed in 36 CFR 1.7(a).

Routes Open to Snowcoach Use

- All routes designated for snowmobile use are also open to snowcoach use.
- In addition, the following routes are open only to snowcoaches:
    - Firehole Canyon Drive.
    - Fountain Flat Road.
    - Virginia Cascades Drive.
    - North Canyon Rim Drive.
    - Riverside Drive.
    - Grand Loop Road from Canyon Junction to Washburn Hot Springs overlook.

The superintendent may open or close these oversnow routes, or portions thereof, or designate new routes for snowcoach travel after taking into consideration the location of wintering wildlife, appropriate snow cover, public safety, and other factors. Notice of such opening or closing will be provided by one or more of the methods listed in 36 CFR 1.7(a).

Guiding Requirements

- Commercial guides would be required for 80% of the daily entries through each entrance beginning with the 2004–2005 season. All businesses providing commercial guiding services in the park would be required to have permits authorizing their operation.

- Beginning with the 2005–2006 season, 20% of the daily entries would be available for self-guided parties in which one member has been certified by the NPS to lead a group of snowmobilers. During the 2004–2005 season, these entries would be available for unguided snowmobiles to allow the NPS time to develop the non- commercial guide training program.
- The park would administer the non- commercial guiding program through issuance of one or more management and operations contracts to oversee a reservation and orientation system for non- commercially guided snowmobiles to help assure that management requirements such as BAT, group size, etc., are met.
- All snowcoaches operating in the park would have to be operated in accordance with a concessions contract, incidental business permit, or other NPS- issued permit.

Table 7. Alt. 5. Yellowstone National Park daily snowmobile entry limits.

Entrance	Commercially Guided Snowmobiles	Non- Commercially Guided Snowmobiles	Total
West Entrance	440	110	550
South Entrance	200	50	250
East Entrance	80	20	100
North Entrance	16	4	20
Old Faithful	24	6	30
Total	**760**	**190**	**950**

ACTIONS SPECIFIC TO GRAND TETON AND THE PARKWAY

Routes Open to Snowmobile Use

- The Continental Divide Snowmobile Trail (CDST) along U.S. 26/287 from the east boundary of GTNP to Moran Junction, and along U.S. 89/287 from Moran Junction to the north boundary of GTNP.
- The CDST along U.S. Highway 89/287 from the south boundary of the Parkway north to the Snake River Bridge.
- U.S. Highway 89/287 from the Snake River Bridge to the north boundary of the Parkway.
- Grassy Lake Road from Flagg Ranch to the west boundary of the Parkway.
- The frozen surface of Jackson Lake for the purpose of ice fishing by persons with a valid Wyoming state fishing license and the proper fishing gear. Jackson will be open generally from the time that the ice reaches sufficient thickness to make the lake safe for snowmobile use. The season will extend until late March or early April, depending on lake conditions, public safety, and resource concerns.

The superintendent may open or close these routes, or portions thereof, for snowmobile travel and may establish separate zones for motorized and non- motorized use on Jackson Lake, after taking into consideration the location of wintering wildlife, appropriate snow cover, public safety and other factors. Notice of such opening or closing will be provided by one or more of the methods listed in 36 CFR 1.7(a).

Routes Open to Snowcoach Use

- Along U.S. Highway 89/287 from the Snake River Bridge to the north boundary of the Parkway.

The superintendent may open or close this oversnow route, or portions thereof, or designate new routes for snowcoach travel after taking into consideration the location of wintering wildlife, appropriate snow cover, public safety, and other factors. Notice of such opening or closing will be provided by one or more of the methods listed in 36 CFR 1.7(a).

Guiding Requirements

- Snowmobile guides would not be required in GTNP or the Parkway.
- All snowcoaches operating in the Parkway would have to be operated in accordance with a concessions contract, incidental business permit, or other NPS- issued permit.

Table 8. Alt. 5. Grand Teton and the Parkway daily snowmobile entry limits.

Entrance	Commercially Guided Snowmobiles	Unguided Snowmobiles	Total
CDST	0	75	75
Grassy Lake Road (Flagg-Ashton Road)	0	75	75
Jackson Lake	0	40	40
Total	**0**	**190**	**190**

ENVIRONMENTALLY PREFERRED ALTERNATIVE

The environmentally preferred alternative is the alternative that will promote the national environmental policy as expressed by §101 of the National Environmental Policy Act. That section states that it is the responsibility of the federal government to improve and coordinate federal plans, functions, programs, and resources "to the end that the Nation may:

- Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- Ensure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
- Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
- Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice;
- Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities; and
- Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources."

Given these criteria, alternative 1 is the environmentally preferred alternative. Alternative 1 is based on Final EIS alternative G and Final SEIS alternative 1b, each of which was determined to be the environmentally preferred alternative by both the NPS and the EPA. Alternative 1 best preserves the unique historic, cultural, and natural resources associated with the parks. This alternative yields the least impacts to air quality, water quality, and natural soundscapes because it relies on mass transit snowcoaches to provide oversnow access to the parks.

Temporary Winter Use Plans Environmental Assessment
Table 9. Summary of Alternatives

	Alternative 1	Alternative 2	Alternative 3	Alternative 4: Preferred Alternative	Alternative 5
Highlights	Emphasizes snowcoach access; prohibits recreational snowmobiling. All snow roads would be open to coaches, including side roads. This alternative most closely matches the November 2000 decision.	Emphasizes snowcoach access while allowing limited snowmobile use; roughly comparable to the winter of 2003–04.	Balances snowmobile and snowcoach access and accommodates visitors who wish to have an unguided snowmobile experience. Growth would occur in coach access.	Allows additional snowmobile use but requires commercial guides for snowmobile access to YNP. This alternative also opens the Firehole Canyon Drive to snowmobiles from noon to 9 PM each day.	Allows the most snowmobile access to the parks. Moderate growth in snowmobile access would occur.
Daily snowmobile limits in YNP	n/a	West: 160 South: 121 East: 22 North: 15 Old Faithful: 0 **YNP Total: 318**	West: 290: 240 com'l; 50 unguided South: 146: 121 com'l; 25 unguided East: 50: 40 com'l; 10 unguided North: 32: 22 com'l; 10 unguided Old Faithful: 22 com'l **YNP Total: 540 (445 com'l; 95 unguided)**	West: 400 South: 220 East: 40 North: 30 Old Faithful: 30 **YNP Total: 720**	West: 550: 440 com'l; 110 non- com'l South: 250: 200 com'l; 50 non- com'l East: 100: 80 com'l; 20 non- com'l North: 20: 16 com'l; 4 non- com'l Old Faithful: 30: 24 com'l; 6 non- com'l **YNP Total: 950 (760 com'l; 190 non- com'l)**
Daily snowmobile limits in GTNP	n/a	CDST: 25 Grassy Lake: 25 Jackson Lake: 0 **GTNP Total: 50**	CDST: 25 Grassy Lake: 25 Jackson Lake: 25 **GTNP Total: 75**	CDST: 50 Grassy Lake: 50 Jackson Lake: 40 **GTNP Total: 140**	CDST: 75 Grassy Lake: 75 Jackson Lake: 40 **GTNP Total: 190**
Snowmobile guide requirements	n/a	*YNP:* 100% commercially guided. *GTNP and the Parkway:* guides not required.	*YNP:* appx. 80% commercially guided, 20% unguided. *GTNP and the Parkway:* guides not required.	*YNP:* 100% commercially guided. *GTNP and the Parkway:* guides not required.	*YNP:* 80% commercially guided, 20% non-commercially guided. *GTNP and the Parkway:* guides not required.
Entry time requirement	None	None	*YNP:* unguided trips must enter by 10:30 A.M. *GTNP:* none.	None	None
Best Available Technology requirements	BAT air emissions required for coaches beginning December 2005.	Required for all snowmobiles. BAT air emissions required for coaches beginning December 2005.	Required for all snowmobiles. BAT air emissions required for coaches beginning December 2005.	Required for all snowmobiles. BAT air emissions required for coaches beginning December 2005.	Required for commercially guided snowmobiles beginning December 2004. Required for all snowmobiles beginning December 2005. BAT air emissions required for coaches beginning December 2005.
Adaptive management	Not practical due to the interim nature of the plan. Supt. may still take action under 36 CFR 1.5 for safety, resource protection or other reasons.	Not practical due to the interim nature of the plan. Supt. may still take action under 36 CFR 1.5 for safety, resource protection or other reasons.	Not practical due to the interim nature of the plan. Supt. may still take action under 36 CFR 1.5 for safety, resource protection or other reasons.	Not practical due to the interim nature of the plan. Supt. may still take action under 36 CFR 1.5 for safety, resource protection or other reasons.	Not practical due to the interim nature of the plan. Supt. may still take action under 36 CFR 1.5 for safety, resource protection or other reasons.

	Alternative 1	Alternative 2	Alternative 3	Alternative 4: Preferred Alternative	Alternative 5
Maximum group size	n/a	No more than 11 snowmobiles	No more than 11 snowmobiles	No more than 11 snowmobiles	No more than 11 snowmobiles
Use of side roads by snowmobiles	n/a	Only Lake Butte Road.	Only Lake Butte Road.	Lake Butte Road and, after 12:00 P.M. each day, Firehole Canyon Drive.	Only Lake Butte Road.
Phase- in of provisions	Immediately.	Immediately.	Unguided snowmobiles would not be permitted during 2004–05; this portion of the entries would be allocated to commercial guides. Unguided entries would be permitted beginning December 2005. Commercial provider would manage the unguided program through a management and service contract.	Immediately.	Non- commercial training program would begin December 2005; this portion of the entries would be unguided during the 2004–2005 season. In cooperation with gateway communities, businesses, counties, and state tourism organizations, a reservation system will be developed to for the effective utilization of the 20% non-commercial entries.
Snowmobiling after interim period	Snowcoaches only, pending completion of further long- term NEPA process.	Snowcoaches only, pending completion of further long- term NEPA process.	Snowcoaches only, pending completion of further long- term NEPA process.	Snowcoaches only, pending completion of further long- term NEPA process.	Snowcoaches only, pending completion of further long- term NEPA process.

Temporary Winter Use Plans Environmental Assessment
Table 10. Summary of Impacts

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Air quality and air quality related values	Compared to historical conditions, major, direct, beneficial, regional, long- term improvements due to exclusive use of snowcoaches; effects would be negligible and adverse in most of Yellowstone, and minor, direct, localized, and adverse on travel corridors and staging areas.	Compared to historical conditions, same as alternative 1, due to use of BAT snowmobiles only and snowcoaches. Compared to alternative 1, effects would be negligible and adverse in most of Yellowstone and minor, direct, localized, and adverse on travel corridors and staging areas.	Compared to historical conditions, same as alternative 1, due to use of BAT snowmobiles only and snowcoaches. Compared to alternative 1, effects would be negligible and adverse in most of Yellowstone; minor, direct, localized, and adverse on travel corridors; and moderate, direct, localized, and adverse on staging areas.	Compared to historical conditions, moderate, direct, beneficial, regional and long- term improvements due to use of BAT snowmobiles only and snowcoaches. Compared to alternative 1, effects would be negligible and adverse in most of Yellowstone, and moderate, direct, localized, and adverse on travel corridors and staging areas.	Compared to historical conditions, moderate, direct, beneficial, regional and long- term improvements due to use of BAT snowmobiles only and snowcoaches. Compared to alternative 1, effects would be negligible and adverse in most of Yellowstone; moderate, direct, localized, and adverse on travel corridors; and moderate to major direct, localized, and adverse on stating areas.
Health and safety	*Vehicular travel accidents:* moderate, beneficial, direct, and long- term impacts due to the restriction to snowcoaches. *Toxic pollutants:* major, beneficial, long- term, and direct effects due to restriction to snowcoaches. *Avalanche control:* With the introduction of the pilot helicopter- based program, adverse, moderate, long- term, and direct threats to employee safety would continue near the East Entrance.	*Vehicular travel accidents:* moderate, beneficial, direct, and long- term impacts due to guide requirements and reduced snowmobiling compared to historical conditions. *Toxic pollutants:* moderate, beneficial, long- term, and direct effects due to BAT requirements and restrictions on snowmobiling compared to historical conditions. *Avalanche control:* Same as alternative 1. Compared to alternative 1, the provision for some snowmobile use in this alternative would result in minor, direct, long- term, and adverse impacts.	*Vehicular travel accidents:* moderate, beneficial, direct, and long- term impacts due to guide requirements and reduced snowmobiling compared to historical conditions. *Toxic pollutants:* Moderate, beneficial, long- term, and direct effects due to BAT requirements and restrictions on snowmobiling compared to historical conditions. *Avalanche control:* same as alternative 1. Compared to alternative 1, the provision for snowmobile use, some of which would be unguided, in this alternative would result in moderate, direct, long- term, and adverse impacts.	*Vehicular travel accidents:* moderate, beneficial, direct, and long- term impacts due to guide requirements. *Toxic pollutants:* moderate, beneficial, long- term, and direct effects due to BAT requirements and restrictions on snowmobiling compared to historical conditions. *Avalanche control:* same as alternative 1. Compared to alternative 1, the provision for snowmobile use in this alternative would result in moderate, direct, long- term, and adverse impacts.	*Vehicular travel accidents:* minor to moderate, beneficial, direct, and long- term impacts due to guide requirements. *Toxic pollutants:* minor to moderate, beneficial, long- term, and direct effects due to BAT requirements and daily snowmobile limits. *Avalanche control:* same as alternative 1. Compared to alternative 1, the provision for snowmobile use, some of which would be unguided, in this alternative would result in moderate, direct, long- term, and adverse impacts.
Natural soundscapes	In developed areas and roadway corridors, the effects of snowcoach-only transportation would generally be minor, direct, short-term, and adverse. Occasionally, when coaches are accelerating effects could be moderate and adverse. Effects in backcountry areas would be	The limited snowmobile and snowcoach use would cause moderate, adverse, direct, and short- term impacts in developed areas, roadway corridors, and backcountry areas. Compared to historical conditions in Yellowstone, major beneficial impacts to park soundscapes.	The snowmobile and snowcoach use would cause moderate, adverse, direct, and short- term impacts in developed areas, roadway corridors, and backcountry areas. Compared to historical conditions in Yellowstone, moderate beneficial impacts to park soundscapes.	The snowmobile and snowcoach use would cause moderate, adverse, direct, and short- term impacts in roadway corridors, developed area, and backcountry areas. On peak days, there could be major adverse effects on all of these areas. However, peak days are expected to comprise	The snowmobile and snowcoach use would cause major, adverse, direct, and short- term impacts in roadway corridors, developed areas, and the backcountry, because the daily snowmobile limit is higher than the historical average. Compared to historical conditions in

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
	negligible. While coaches may be individually noisy and their number will increase under this alternative, the concomitant reduction in snowmobile numbers produces significant beneficial impacts to soundscapes. Compared to historical conditions in Yellowstone, major beneficial impacts to park soundscapes.			less than 15% of the winter season. Compared to historical conditions in Yellowstone, moderate beneficial impacts to park soundscapes.	Yellowstone, minor beneficial impacts to park soundscapes.
Visitor access and circulation	Adverse effects to those visitors whose park experience depends upon traveling by snowmobile.	Adverse effects to visitors wishing to visit YNP on snowmobile but may be unable to do so because of daily entry limits This could be offset by utilizing a different entrance or visiting on a different day.	Same as alternative 2.	Same as alternative 2.	Same as alternative 2.
Visitor experience	Compared to historical conditions, the restriction to snowcoaches would have major, direct, short- term, and beneficial impacts on all facets of the visitor experience.	Compared to historical conditions, this alternative would have major, direct, short-term, and beneficial impacts on most facets of the visitor experience, with moderate to major beneficial impacts on safety. Compared to alternative 1, moderate, direct, short- term, and adverse impacts due to the effect of more vehicles on quiet, solitude, and road surface quality.	Compared to historical conditions, this alternative would have moderate to major, direct, short- term, and beneficial impacts on most facets of the visitor experience, with moderate to major beneficial impacts on safety. Compared to alternative 1, moderate, direct, short- term, and adverse impacts due to the effect of more vehicles on quiet, solitude, and road surface quality. The provision for some unguided access would also adversely affect safety.	Compared to historical conditions, this alternative would have moderate, direct, short-term, and beneficial impacts on all facets of the visitor experience. Compared to alternative 1, moderate drect, short-term, and adverse impacts due to the effect of more vehicles on quiet, solitude, and road surface quality.	Compared to historical conditions, this alternative would have moderate, direct, short-term, and beneficial impacts on all facets of the visitor experience. Compared to alternative 1, major, direct, short-term, and adverse impacts due to the effect of more vehicles on quiet, solitude, and road surface quality. The provision for some non-commercial guided access would also adversely affect safety and wildlife.
Wildlife—bison and elk	*Vehicle- related mortality:* negligible adverse impacts because of negligible mortality associated with snowcoaches. *Stress response and displacement:* minor to moderate adverse effects as a result of having substantially fewer total vehicles, but substantially increased numbers of much larger	*Vehicle- related mortality:* fewer vehicles compared to historical levels would result in negligible adverse impacts. *Stress response and displacement:* minor to moderate adverse effects as a result of having substantially fewer total vehicles, but substantially increased numbers of much larger	*Vehicle- related mortality:* fewer vehicles compared to historical levels would result in negligible adverse impacts. *Stress response and displacement:* minor to moderate adverse effects as a result of having fewer total vehicles, but increased numbers of much larger snowcoaches compared	*Vehicle- related mortality:* negligible adverse impacts because the daily snowmobile limit (720) is close to the historical average, which resulted in few wildlife deaths. *Stress response and displacement:* moderate adverse effects as a result of having similar numbers of total snowmobiles and	*Vehicle- related mortality:* minor adverse impacts because the daily snowmobile limit (950) is more than the historical average, which resulted in some wildlife deaths. *Stress response and displacement:* moderate adverse effects because the daily snowmobile limit is 132% of the historical average and

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
	vehicles compared to historical conditions. *Population impacts:* Fewer vehicles compared to historical levels would mean negligible impacts. Compared to historical conditions, beneficial impacts upon all facets of wildlife- oversnow vehicle (OSV) interactions because the number of OSVs in the parks would dramatically decline and all visitors would be traveling in guided groups.	vehicles compared to historical conditions. *Population impacts:* Fewer vehicles compared to historical levels would mean negligible impacts. Compared to historical conditions, beneficial impacts upon all facets of wildlife- OSV interactions, because the number of OSVs in the parks would decline and all visitors would be traveling in guided groups.	to historical conditions. *Population impacts:* Fewer vehicles compared to historical levels would mean negligible impacts. Compared to historical conditions, beneficial impacts upon all facets of wildlife- OSV interactions, because the number of OSVs in the parks would decline and most visitors would be traveling in guided groups.	potentially, increased numbers of snowcoaches compared to historical conditions. *Population impacts:* Negligible to minor impacts because no negative population-level impacts have been detected under similar levels of snowmobile use. Compared to historical conditions, beneficial impacts upon all facets of wildlife- OSV interactions because most visitors would be traveling in guided groups.	potentially, increased numbers of snowcoaches compared to historical conditions. *Population impacts:* Negligible to minor impacts because no negative population-level impacts have been detected under similar levels of snowmobile use. Compared to historical conditions, negligible beneficial impacts upon all facets of wildlife-OSV interactions because although vehicle numbers would increase over the historical average, all snowmobilers would be traveling in guided groups.

Table 10, Continued. Summary of Socioeconomic Impacts

Estimated Economic Impacts Relative to Historic Snowmobile Use	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
	High to Low	High to Low	High to Low	High to Low	High to Low
Total local business impact (in 1997 dollars)			(in millions of dollars)		
Five- county	−26.8 to −10.1	−16.7 to −5.2	−12.1 to −2.6	−10.1 to −.1	−6.7 to 1.4
Three- state	−30.4 to −11.5	−18.9 to −5.8	−13.8 to −2.9	−11.5 to −.2	−7.6 to 1.6
West Yellowstone	−9.4 to −3.6	−5.9 to −1.8	−4.2 to −.9	−3.6 to −.05	−2.3 to .5
Jackson	−6.7 to −2.5	−4.2 to −1.3	−3 to −.6	−2.5 to −.04	−1.7 to .4
Cody	−.2 to −.07	−.1 to −.03	−.08 to −.02	−.06 to −.001	−.04 to .01

Estimated Economic Impacts Relative to a Snowmobile Ban	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
		High to Low	High to Low	High to Low	High to Low
Total local business impact (in 1997 dollars)	Alternative 1 in the EA is a snowmobile ban, thus it represents a baseline and there would be zero impacts.		(in millions of dollars)		
Five- county		10.1 to 5	14.7 to 7.6	16.7 to 10	20.2 to 11.6
Three- state		11.5 to 5.7	16.7 to 8.6	18.9 to 11.3	22.9 to 13.1
West Yellowstone		3.6 to 1.8	5.2 to 2.7	5.9 to 3.5	7.1 to 4.1
Jackson		2.5 to 1.3	3.7 to 1.9	4.2 to 2.5	5, to 2.9
Cody		.06 to .03	.09 to .05	.1 to .06	.1 to .07


National Park Service
U.S. Forest Service
U.S. Fish and Wildlife Service
TETON National Wilderness Preservation System
Lands administered by the U.S. Bureau of Land Management and by states are not shown.
0 10 30 Kilometers
0 10 30 Miles
North
BEAVERHEAD-DEERLODGE NF
GALLATIN NF
MONTANA
LEE METCALF
CUSTER NF
ABSAROKA-BEARTOOTH
Gardiner
Cooke City
LEE METCALF
NORTH ABSAROKA
West Yellowstone
RED ROCK LAKES NWR
RED ROCK LAKES
Cody
TARGHEE NF
WINEGAR HOLE
IDAHO
JEDEDIAH SMITH
TETON
SHOSHONE NF
WASHAKIE
NATIONAL ELK REFUGE
CARIBOU-TARGHEE NF
Jackson
GROS VENTRE
WIND RIVER INDIAN RESERVATION
FITZ-PATRICK
BRIDGER-TETON NF
GRAYS LAKE NWR
BRIDGER
SHOSHONE NF
WYOMING
POPO AGIE
Greater Yellowstone Area

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CHAPTER III. AFFECTED ENVIRONMENT

INTRODUCTION

This chapter describes the environment of the area that could be affected by the alternatives under consideration. Given the scope of the EA, much of the affected environment has already been described in the Final EIS and Final SEIS. Therefore, large portions of the EIS and SEIS affected environment sections are incorporated by reference, as described below. An effort has been made to focus on only those topics for which new information is available, including enough background information for the convenience of the reader and for continuity with the effects disclosed in Chapter IV. In this chapter, mandatory EIS topics are reviewed with notations of their applicability in this process, and where they are discussed in either the EIS or the SEIS (incorporated by reference).

MANDATORY TOPICS

Council on Environmental Quality regulations (40 CFR part 1500) and NPS policy (NPS DO- 12) require that certain topics be addressed in every EA. The Final EIS (pages 101–102) and the Final SEIS (pages 91–92) describe these topics with reference to the CFR, EO, or other direction. The disposition of each topic in the Final EIS, the Final SEIS, and/or this EA is indicated in Table 11.

Table 11. Disposition of mandatory impact topics.

Topic	Disposition		
	Final EIS	**Final SEIS**	**This EA**
Possible conflicts between alternatives and land use plans and policies of other jurisdictions or agencies	See "Direct, Indirect and Cumulative Effects on Adjacent Lands," p. 434.	See "Direct, Indirect, and Cumulative Impacts on Adjacent Lands," p. 246.	See "Impact Topics Addressed."
Energy requirements and conservation potential	Dismissed, p. 101.	Tier to Final EIS.	Tier to Final EIS.
Natural or depletable resource requirements and conservation potential	Dismissed, p. 101.	Tier to Final EIS.	Tier to Final EIS.
Urban quality and historic and cultural resources	See "Effects on Cultural Resources" for each alternative in Chapter IV.	See "Additional Topics Dismissed," p. 92–94.	Dismissed; tier to Final SEIS.
Socially or economically disadvantaged populations	See "Effects on Minority and Low Income Populations" for each alternative in Chapter IV.	See "Additional Topics Dismissed," p. 92–94.	Dismissed; tier to Final SEIS.
Wetlands and floodplains	Floodplains dismissed, p. 102. See "Effects on Aquatic Resources" for each alternative in Chapter IV.	Tier to Final EIS; see "Additional Topics Dismissed," p. 92–94.	Tier to Final SEIS and Final EIS.

Topic	Disposition		
	Final EIS	**Final SEIS**	**This EA**
Prime and unique agricultural lands	Dismissed, p. 102.	Tier to Final EIS.	Tier to Final EIS.
Endangered or threatened plants and animals	See "Effects on Federally Protected Species" for each alternative in Chapter IV.	See "Impact Topics Addressed."	See "Impact Topics Addressed."
Important scientific, archeological, and other cultural resources	See "Effects on Natural Resources" and "Effects on Cultural Resources" for each alternative in Chapter IV.	See "Additional Topics Dismissed."	Tier to Final SEIS.
Ecologically critical areas, wild and scenic rivers, and other unique natural resources	Dismissed (pp. 102 and 106) except for topics associated with wildlife habitat.	See "Additional Topics Dismissed" and "Impact Topics Addressed."	Tier to Final EIS and Final SEIS.
Public health and safety	See "Effects on Air Quality and Public Health" and "Public Safety" for each alternative in Chapter IV.	See "Impact Topics Addressed."	See "Impact Topics Addressed.
Sacred sites and Indian Trust resources	See "Effects on Cultural Resources" for each alternative in Chapter IV.	See "Additional Topics Dismissed," p. 92–94.	Tier to Final SEIS.

IMPACT TOPICS DISMISSED

FINAL EIS TOPICS DISMISSED

The Final EIS lists the topics dismissed from extensive analysis with an explanation of the reason for doing so (pages 102–106). The Final EIS material is incorporated by reference into this EA. Topics dismissed were:

- Floodplains
- Black bear (*Ursus americanus*)
- Mid- sized carnivores
- Subnivian fauna
- Bullfrog (*Rana catesbeiana*)
- Mountain goat (*Oreamnos americanus*
- Reptiles
- Exotic species – plants
- Exotic species – animals
- Vegetation
- Birds

ADDITIONAL TOPICS DISMISSED IN THE SEIS

The Final SEIS lists additional topics (pages 92- 94) that were dismissed because the impacts had been disclosed in the Final EIS, and no new information or alternative resulted in different impacts. Topics dismissed were:

- Federally protected species
- Cultural resources
- Water and aquatic resources
- Ungulates other than bison and elk
- Minority and low income populations
- Geothermal resources
- Wildlife and uses not pertaining to oversnow motorized access
- Wildlife species of special concern

ADDITIONAL TOPICS DISMISSED IN THIS EA

Ungulate Road Use

The extent to which ungulates, specifically bison, use groomed road surfaces for travel and how that use may affect their population is currently unclear (Meagher 1989, 1998, Taper et al. 2000, Bjornlie and Garrott 2001). Although this issue is important for assessing the effects of motorized winter use on ungulates, it is not addressed in this EA because a series of ongoing investigations and analyses on the topic have not yet been completed.

During the winters of 2002–2003 and 2003–2004, the Yellowstone Center for Resources, the Resource Management and Visitor Protection Office, and the Planning and Compliance Office collaboratively initiated several efforts to analyze winter use data collected from 1998 to 2004 through partnerships with statisticians and biologists at Montana State University and the University of Calgary. Some of these efforts address several wildlife species, while others focus on bison. These efforts and the principal partners are as follows:

1. Expert panel review of the influence of road grooming on bison in Yellowstone (Dr. Cormack Gates, University of Calgary). Completion estimated March 2005.
2. Analysis of wildlife distribution and responses to motorized winter use from 1998 to 2004 (Drs. John Borkowski and Robert Garrott, Ecology Department, Montana State University). Completion estimated March 2005.
3. Analysis of bison distribution and use of groomed roads from 1998 to 2004 (Drs. John Borkowski and Robert Garrott). Completion estimated September 2005.
4. Integration and analysis of existing data (~1960–2002) on bison demography, winter movements, and distribution patterns with respect to the groomed road system (Dr. Robert Garrott). Completion estimated September 2005.
5. Conceptual models of bison movement through Yellowstone based on remotely sensed landscape features (e.g., vegetation, terrain, and geothermal maps), snow pack measurements and modeling, and bison distribution data. These models are designed to predict the distributions of bison on the landscape in various environmental and landscape conditions, but field data of actual trails must be collected in order to check the accuracy of the predictions. If the models predict bison trail systems and movements accurately, then the NPS can compare predictions of bison movement based on environmental constraints with the existing groomed road system to evaluate how grooming has affected bison movements (Drs. Robert Garrott and John Borkowski of MSU and Drs. Fred Watson and Susan Alexander, California State University–Monterey Bay). Completion estimated September

2005.

Due to the administrative and scientific complexity inherent in the analyses listed above, the projected completion dates are the best available estimates. In addition to these collaborative efforts, Yellowstone's Bison Ecology and Management Office monitors movement patterns and distribution of bison on a continuing basis using telemetry data, including newly- deployed GPS units.

Winter Use Not Pertaining to Oversnow Motorized Access

Impacts unrelated to oversnow motorized use (e.g., wheeled vehicles, plowed roads, and non-motorized recreation) are outside the scope of this EA. The evaluation of such impacts was analyzed in the Final EIS and is incorporated by reference. (See the Final EIS, Chapter IV, pages 238–253, for a complete review under alternative A. Other EIS alternatives compare and contrast effects to wildlife relative to alternative A.) In regard to the effects of non- motorized uses on wildlife, the existing decision closes or restricts areas to non- motorized use where wildlife winter habitat concerns exist. This aspect of the existing decision is not material in regard to new snowmobile technology, or to potential impacts of snowmobiles. Therefore, the analysis is not revisited in this EA.

Federally Protected Species

- Grizzly bear
- Gray wolf
- Canada lynx
- Whooping crane

No new information on grizzly bears, gray wolves, and bald eagles is available that would alter the assessment of impacts. Therefore, information on impacts on these species is incorporated by reference. (See Final EIS Chapter IV, pages 245–253, for a complete review under alternative A.) The whooping crane is no longer on the species list issued by the U.S. Fish and Wildlife Service (FWS) for Yellowstone and Grand Teton national parks because there are no naturally reproducing populations in YNP, GTNP, or the Parkway. New information and analyses relevant to the Canada lynx is provided below and later in this chapter.

In the Final SEIS, Yellowstone National Park reached a "may affect, not likely to adversely affect" conclusion on the preferred alternative in regard to federally protected species. The FWS March 21, 2003, Biological Opinion, prepared due to the need to consult formally on lynx, stated that the actions anticipated by the SEIS would have "no effect" on the whooping crane, and summarized that the actions "may effect, but are not likely to adversely affect" the bald eagle, grizzly bear, and gray wolf (NPS 2002) if the following conservation measures are adhered to (FWS 2003):

1. Compliance with the Greater Yellowstone Bald Eagle Management Plan.
2. Compliance with the Interagency Grizzly Bear Guidelines.
3. Bear- proofing garbage facilities.

Implementation of and compliance with area closures if conflicts with threatened or endangered species arise.

4. Winter closures on the Snake River and Buffalo Fork floodplains and other locations within a 0.5- mile radius around bald eagle nests.
5. Closure of areas within a 0.5- mile radius around bald eagle nests in GTNP starting 15 February.

6. Removal of carcasses along park roads.
7. Closure of areas to winter use where post- and pre- denning bear activity is high.
8. Continued assessment of grizzly bear abundance, distribution, habitat selection, and den locations.
9. Continued education of the public about the potential effects of winter recreation on wildlife by developing materials including interpretive programs available on snowcoaches and in warming huts.
10. Continued monitoring of gray wolf populations.
11. Documentation of gray wolf distribution and abundance during carnivore surveys.

The FWS Biological Opinion, which addressed only lynx in formal consultation, determined that actions proposed in the SEIS were not likely to jeopardize the existence of Canada lynx and that impacts to Canada lynx would be insignificant or discountable, thus none was authorized. No take of Canada lynx was anticipated. The FWS reached these conclusions because effects did not rise to the level of causing adverse impacts to Canada lynx, and because of the park's implementation of measures described in the "Mitigation for Federally Protected Species and Species of Concern" (NPS 2002), "Conservation Measures" (NPS 2002), and "Current Management Policies and Requirements Related to Canada lynx" (NPS 2002).

On March 31, 2004, the U.S. Court of Appeals for the D.C. Circuit vacated its December 2002 injunction which had prevented the FWS from issuing letters of concurrence on proposed federal actions that may affect, but are not likely to adversely affect Canada lynx. That ruling, which was in effect until March 31, 2004, required the FWS to prepare biological opinions when action agencies proposed projects that had "may affect, but not likely to adversely affect" determinations. The December 2002 ruling did not affect the manner and documentation for informal consultations sought by action agencies, i.e., action agencies could still submit for concurrence "may affect, not likely to adversely affect" determinations. Based on the April 2004 ruling, the FWS has resumed issuing letters of concurrence (i.e., complete informal consultation) when proposed federal actions are not likely to adversely affect Canada lynx.

The Lynx Conservation and Assessment Strategy (LCAS) was developed by the U.S. Forest Service (Department of Agriculture) and the FWS and Bureau of Land Management (Department of the Interior) to conserve Canada lynx in the conterminous U.S. Although the National Park Service is not a signatory to the LCAS, Yellowstone and Grand Teton National Parks use LCAS standards and guidelines to evaluate the extent to which their discretionary activities affect lynx populations and habitats. Similarly, the FWS uses the LCAS to evaluate the potential effects of projects proposed by action agencies. The parks may propose projects that result in conditions that deviate from LCAS standards, but deviations are typically remedied during informal consultation by changing project descriptions, adding conservation measures, and/or by collecting more detailed field information.

Reinitiation of formal consultation on the proposed action (including any of the EA alternatives) is not required for any of the listed species in the action area except for lynx because: 1) the extent of incidental take has not been exceeded and no incidental take is anticipated; 2) there is no new information revealing effects of the action that may affect listed species or critical habitat in a manner or to an extent not considered in the initial biological opinion; 3) the action has not been modified in a manner that causes an effect to the listed species or critical habitat not considered in the initial biological opinion; and 4) there are no new listed species or designated critical habitat that may be affected by the action (50 CFR §402.16). However, the NPS will be

asking that the FWS concur with the NPS determination that this action "may affect but is not likely to adversely affect" Canada lynx, since there is new information lynx and since we can request such a concurrence now, because the injunction is dissolved.

IMPACT TOPICS ADDRESSED IN THIS TEMPORARY EA

The impact topics that remain to be discussed are those relating to new information or changed modeling assumptions for which analysis may have altered the assessment of effects from that presented in the Final EIS or the Final SEIS. For some impact topics, even though reported effects might be different, there may be no new information specific to that impact topic to present. For example, there may be no new information to report about visitor experience in the affected environment section. However, new technology or other means of mitigation in an EA alternative could result in impacts that are different from those disclosed in the Final EIS or the Final SEIS. In such cases, information provided in these documents is incorporated by reference, and summarized and referenced appropriately in this EA. A determination that there is no new information to report about a topic in the affected environment, and no new impacts that would vary by alternative in this analysis, results in the dismissal of the topic from this EA.

Impact topics addressed in this chapter are listed in Table 12. New information or appropriate references are provided under each specific topic heading later in this chapter.

Table 12. Impact topics addressed in this EA.

Topic	Focus of Additional Analysis
Air quality and air quality- related values	Modeling has been done to allow comparisons to be made among the alternatives. Monitoring data from the 2003–2004 and 2002–2003 seasons has also been added.
Health and safety	The effect of interim limits and guiding requirements on snowmobile use varies among the alternatives. A report assessing employee exposure to noise and air pollution during the 2003–2004 season is summarized.
Natural soundscapes	Monitoring information from the 2002–2003 and 2003–2004 seasons is used to make comparisons among alternatives. Modeling data from the SEIS is also used.
Socioeconomics	Economic information and models have been updated based on the alternatives proposed in this EA. In addition, a 2002–2003 winter visitor survey conducted by Research Triangle Institute has provided new information for modeling assumptions.
Visitor access and circulation	This topic is included even though the alternatives do not significantly change visitor access, since all alternatives allow motorized access to the parks.
Visitor experience	The effect of guiding requirements and interim limits on snowmobile use varies among the alternatives.
Wildlife—bison and elk	Monitoring information related to the effects of oversnow vehicles on wildlife allows comparisons to be made among alternatives.

Topic	Focus of Additional Analysis
Adjacent lands	The effect of interim limits on snowmobile use varies marginally among the alternatives.

BEST AVAILABLE TECHNOLOGY

SNOWMOBILES

Procedures to determine BAT for snowmobiles were outlined in the December 11, 2003, regulation. The NPS had identified BAT for snowmobiles as air emissions no greater than 15 g/kw- hr for hydrocarbons (HC) and 120 g/kw- hr for carbon monoxide (CO). These emissions result in a 90% reduction in hydrocarbons and a 70% reduction in carbon monoxide compared to EPA assumptions for uncontrolled snowmobiles. (These reductions are applicable prior to the phase- in of EPA's national snowmobile regulations beginning in 2006 and culminating in 2012. As EPA's snowmobile regulations are phased- in, the current BAT requirements would be substantially less as a percent reduction of emissions, since snowmobiles on the whole would become cleaner).

For sound emissions, BAT was no more than 73 dBA when measured using SAE J192 test procedures (March 1985). The December 11, 2003, regulations allowed snowmobiles to be tested at any atmospheric pressure above 23.4 inches Hg (uncorrected). This allowance more closely replicates the higher elevations (and consequently, the reduced atmospheric pressure) found in Yellowstone, where the BAT sound requirement was set based on snowmobile testing. The J192 test procedures allow a +2 dBA tolerance to account for variations in test site, temperature gradients, wind velocity gradients, test equipment, and inherent differences in nominally identical vehicles. (It has been observed that under some test site conditions, variability in test results greater than 2 dBA can be experienced.) Therefore, snowmobiles may test as high as 75 dBA and be considered BAT. For comparative purposes, a standard two- stroke snowmobile is generally 78- 80 dBA. A 5 dBA difference is generally perceived as a doubling of sound..

To simplify determining compliance with BAT requirements, the December 2003 regulation required that snowmobile manufacturers submit to the NPS their Family Emissions Limit (FEL) application for snowmobiles they were interested in certifying as BAT beginning with the 2005 model year. The FEL application is filed with the EPA to comply with the EPA's general snowmobile regulations, under which emissions may not exceed the FEL. Thus, the FEL ensures that all certified snowmobile models entering the parks actually meet the BAT requirements. The following (Table 13) is a list of snowmobile makes, models, and year of manufacture that have been certified as BAT.

Table 13. Snowmobiles meeting Yellowstone and Grand Teton National Parks' Best Available Technology requirements.

	Average Air Emissions (g/kW- hr)		Sound Emissions (dBA)
	Hydrocarbons	Carbon Monoxide	
BAT REQUIREMENTS	Less than 15	Less than 120	73 or less
2002 Arctic Cat 4- Stroke Touring	6.20	79.95	71.3
2002 Arctic Cat 4- Stroke Trail	6.20	79.95	72.0
2002 Polaris Frontier Touring	3.19	79.15	74.6
2003 Arctic Cat 4- Stroke Touring	7.55	95.40	70.1
2003 Arctic Cat 4- Stroke Trail	7.55	95.40	72.2
2003 Polaris Frontier Classic	5.4	111.6	74.3
2003 Polaris Frontier Touring	5.4	111.6	73.3
2004 Arctic Cat T660 Touring	5.62	92.30	71.75
2004 Bombardier Ski- Doo Elite SE, equipped with Elite BAT Upgrade	4.65	103.16	74.8
2004 Bombardier Ski- Doo Legend Sport GT V1000, equipped with BAT Upgrade (P/N 861- 205- 300)	6.12	92.93	72.3
2004 Polaris Frontier Classic	5.4	111.6	73.2
2004 Polaris Frontier Touring	5.4	111.6	73.7
Average 2- Stroke Snowmobile in 2002 (Non- BAT)	150	400	No greater than 78

Notes to table:

- Emission figures presented are Official Test Results, which constitute an average of actual engine emissions. Family emissions limits only exist for 2003 model- year snowmobiles, when EPA's snowmobile rule started to be phased- in, and thus are not presented in this table.
- The 2002 Arctic Cat Trail and Touring models use the same engine and likewise have the same emissions. This is also the case with the 2003 Trail and Touring models.
- The Polaris 2003 and 2004 machines have identical emissions and sound results because only minor calibration changes were made which would not affect emissions or sound.
- The 2004 Bombardier Ski- Doo Elite SE and Legend Sport GT V1000 must be equipped with BAT upgrade kits in order to meet BAT noise requirements. The upgrade kits lower sound levels by controlling the maximum throttle body opening and use different software for the snowmobile's electronic control unit.

SNOWCOACHES

The December 11, 2003, regulation also outlined BAT requirements for snowcoaches. For air emissions, snowcoaches were required to meet all EPA emissions standards that were in place when the vehicle was manufactured. Thus, all original pollution control equipment was required to be installed and functioning. If critical pollution control equipment, such as the catalytic converter, associated piping, or other related parts that might increase hydrocarbon, carbon monoxide, or particulate matter emissions in the event of mechanical failure or deterioration, had exceeded its useful life as published by the EPA, the owner would be required to replace it

with the original equipment, if available. These air emissions requirements would have been implemented beginning with the 2005–2006 season.

For sound emissions, snowcoaches would have been required to operate at or below 75 dB by the 2008–2009 season, as measured at 25 mph, using test procedures similar to those of SAE J1161.

Historic snowcoaches, defined as Bombardier coaches manufactured in 1983 or earlier, would initially have been exempt from air and sound requirements. However, the NPS intended to work with individual owners of these coaches to retrofit them to meet BAT requirements.

NPS WINTER OPERATIONS

The SEIS contains a discussion of NPS winter operations on pages 102–105 that remains relevant and is incorporated by reference. Administrative uses of the parks are outside the scope of this EA. Since the SEIS was published, the NPS has continued converting its administrative snowmobile fleet to BAT. For the 2003- 2004 season, YNP had 131 snowmobiles in its administrative fleet, of which 83 met BAT requirements, 22 were non- BAT four- stoke vehicles (Arctic Cat Turbo and Bearcat sleds), and 26 were two- stroke vehicles."

AIR QUALITY AND AIR QUALITY- RELATED VALUES

Air quality and public health issues as they pertain to winter use are explained in the Final EIS (pages 123–128) and the Final SEIS (pages 110–114). Those documents provide information about historical snowmobile emissions, air quality regulations, state and federal ambient air quality standards, relevant research, and the snowmobile requirements under the EPA rule for recreational vehicles. That information is incorporated by reference and briefly summarized here, along with the most recent data obtained from air quality monitoring programs and trends in air quality.

Yellowstone and Grand Teton national parks are classified as mandatory Class I areas under the Federal Clean Air Act (42 USC 7401 et seq.). This most stringent air quality classification is aimed at protecting parks and wilderness areas from air quality degradation. The act gives federal land managers the responsibility for protecting air quality and related values. The Federal Clean Air Act, as amended in 1990, requires the EPA to establish National Ambient Air Quality Standards (NAAQS) to protect public health and welfare. Standards have been set for six pollutants: particulate matter (PM), carbon monoxide (CO), nitrogen oxides (NOx), sulfur dioxide (SO_2), ozone (O_3), and lead (Pb). These pollutants are considered criteria pollutants because the standards satisfy criteria specified in the act. The standards for criteria pollutants, as purveyed under federal and state jurisdictions, are shown in the Final EIS (Table 28, page 125). The states of Montana and Wyoming have adopted more stringent standards for some pollutants. Although jurisdiction for NAAQS enforcement of NAAQS is delegated to the states, federal land managers are responsible under the Clean Air Act to protect air quality and air quality- related values including visibility. Moreover, the federal land manager (e.g., the park superintendent) has the authority and jurisdiction to manage activities within park boundaries that impact park air quality and air quality- related values.

Snowmobile emissions have been the source of the vehicle emission and health- related complaints in Yellowstone. Under historical conditions, increases in the number of snowmobiles in the parks intensified concerns regarding air pollution and its effects on the health of park employees, operators and riders of snowmobiles, and other visitors. A two- stroke engine that provides a high power/weight ratio was the typical power plant used, and these engines produce relatively high emissions of CO, unburned hydrocarbons (HC), and fine particulate matter ($PM_{2.5}$) compared to modern automobile engines and they do not incorporate pollution control equipment.

- CO is a colorless, odorless, and poisonous gas produced by incomplete burning of carbon in fuels. When CO enters the bloodstream, it reduces the delivery of oxygen to the body's organs and tissues. Health effects may include impairment of visual perception, manual dexterity, learning ability, and performance of complex tasks; headaches and fatigue; or respiratory failure and death.
- HCs include air toxics or hazardous air pollutants such as benzene, formaldehyde, and 1,3 butadiene.
- PM includes dust, dirt, soot, smoke, and liquid droplets from sources such as power plants, vehicles, construction activity, fires, and windblown dust. PM can either be emitted directly from such sources or formed in the atmosphere through secondary reactions or condensation. Health effects from PM emissions include reduced lung function, long- term risk of increased cancer rates, and the development or aggravation of respiratory problems.

During the 2003–2004 season, two- stroke snowmobiles were largely replaced by four- stroke snowmobiles that met the BAT requirements for HC and CO. Conservatively estimated, more than 80% of the snowmobiles operating in the parks that winter met BAT requirements. This change, combined with an overall reduction in snowmobiles from previous years, led to a marked reduction in ambient pollution levels.

Air quality monitors for CO and $PM_{2.5}$ are located at both the West Entrance and Old Faithful. The West Entrance monitors are operated throughout the year, while the Old Faithful monitors are typically operated from mid- December through mid- March. CO and $PM_{2.5}$ monitors were operated for the past two years at both locations and CO monitoring has been conducted at the West Entrance since 1998. Monitors were also operated for the 2002–2003 season at Flagg Ranch. Table 14 below provides a summary of the monitoring results for these locations.

For comparative purposes, spring, summer, and fall CO levels are almost always less than 2 ppm (Coefield 2002). Other than one hour in August of 2000, all of the CO values measured at the West Entrance through March 2004 that exceeded 3 ppm (parts per million) were recorded during the winter and associated with snowmobile traffic.

Table 14. CO and $PM_{2.5}$ monitoring data for Yellowstone and Grand Teton.

Location	Winter Season	1- hr CO (ppm)[1] concentrations		8- hr CO (ppm)[2] concentrations		24- hr $PM_{2.5}$ (ug/m^3)[3] concentrations	
		1st max.	2nd max.	1st max.	2nd max.	1st value	98% value
West Yellowstone	1998–1999	18.2	11.1	8.9	4.3	NA	NA
	1999–2000	13.5	13.1	5.4	4.7	NA	NA
	2000–2001	17.9	17.4	6.0	5.3	NA	NA
	2001–2002	16.0	13.7	5.4	4.9	NA	NA
	2002–2003	7.9	3.4	3.3	1.7	19.2	16.4
	2003–2004	6.4	3.1	1.3	1.1	9.0	7.0
Old Faithful	2002–2003	2.9	2.0	1.2	1.0	41.0	22.3
	2003–2004	2.2	1.7	0.9	0.9	16.5	14.5
Flagg Ranch	2002–2003	4.7	3.1	1.7	1.1	16.4	10.7
National AAQS		- - -	35	- - -	9	- - -	65
Montana AAQS		- - -	23	- - -	9	- - -	65

NA - Not Available
[1]The 1- hour CO NAAQS is based on the 2nd maximum concentration.
[2]The 8- hour CO NAAQS is based on the 2nd maximum concentration.
[3]The 24- hour $PM_{2.5}$ NAAQS is based on the 3- year average of the 98th percentile of 24- hour $PM_{2.5}$ concentrations; however, no more than two years of data are available for park monitors. The annual 98th percentile is given to show the improvement between winter seasons. Comparison with the annual standard is not shown.

During the 2003–2004 season, all observed concentrations of $PM_{2.5}$ and CO were below the NAAQS. The maximum rolling 24- hour average concentration for $PM_{2.5}$ decreased by about 60%, and the maximum 1- hr and 8- hr CO concentrations decreased by about 24% at Old Faithful. Peak values, as indicated by maximum 1- hour or by the 98th percentile, also decreased. The combination of less traffic, cleaner engine exhaust, ethanol- enhanced fuels, and less idling time appears to have improved the air quality at the two monitoring locations. A longer term trend for CO is provided in Figure 1 below, which shows trends in both snowmobile counts and maximum 1- hr CO concentrations since the 1998–1999 season.

In addition to snowmobile and snowcoach emissions, a significant driver of air quality is meteorological conditions. Days where inversions occur, with little or no wind, tend to facilitate the accumulation of pollution in areas where snowmobiles congregate, such as the West Entrance. This phenomenon was illustrated on the two days during the 2003–2004 season in which the highest CO concentrations were observed. On December 23, 2003, a 1- hour CO concentration of 6.3 ppm was observed at the West Entrance at 5:00 P.M., with only 143 snowmobiles entering the park's West Entrance on that day. On February 12, 2004, 181 snowmobiles entered the West Entrance, and a 1- hour CO concentration of 3.1 ppm was

observed. By contrast, the West Entrance's busiest day during the 2003–2004 season, with 307 snowmobiles, had a maximum 1- hour CO concentration of 1.5 ppm.

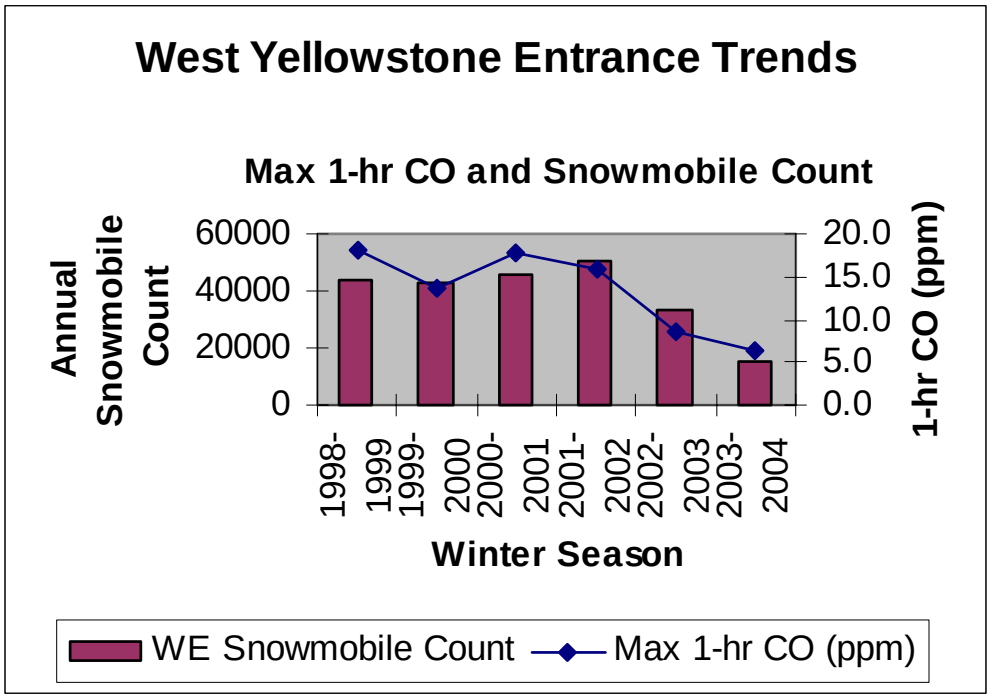

Figure 1. Trends in maximum 1- hour CO level and West Entrance annual snowmobile visitation.

HEALTH AND SAFETY

There are a variety of hazards associated with traveling through Yellowstone and Grand Teton National Parks during winter, including avalanches, hypothermia, blowing snow and poor visibility, bison and other wildlife on the road, vehicular traffic, and moguls and other difficult road conditions. Health and safety issues that pertain to winter use are explained in the Final EIS (pages 123–139) and the Final SEIS (pages 114–117). That information on air and sound emissions from snowmobiles and snowcoaches, repetitive motion injuries, avalanches, other snowmobilers' behavior, air quality and public health, and motor vehicle accidents is incorporated into this EA by reference. This section contains information on health and safety issues that has become available since the Final SEIS was completed.

COMMERCIAL GUIDING

During the winter of 2003–2004, all snowmobilers were led by commercial guides for the first time in Yellowstone National Park's history. This had a significant effect on visitor health and safety. Some visitors to Yellowstone may have never ridden a snowmobile in their life, and commercial guides can help teach them how to safely travel through the park. They are experts at snowmobiling in Yellowstone National Park and the conditions associated with it. All commercial guides are trained in basic first aid and CPR. In addition to first aid kits, they often

carry satellite or cellular telephones, radios, or other communication devices for emergency use, and shovels to use in digging out oversnow vehicles (OSVs) in case of an avalanche. Commercial guides use a "follow- the- leader" approach, stopping often to talk with the group. They lead snowmobiles single- file through the park, using hand signals to pass information down the line from one snowmobile to the next, which has proven to be effective. Signals are used to warn group members about wildlife and other road hazards, indicate turns, and when to turn on or off the snowmobile.

The benefits of commercial guides for health and safety are illustrated in Table 15. During the 2003–2004 season, with all snowmobile access commercially guided, park rangers had 55% fewer incidents involving snowmobile citations; 82% fewer moving violations, and they made 90% fewer arrests compared to the previous winter. Looked at another way, during the 2002–2003 season, park rangers had an average of 2.6 cases per day with moving violations involving snowmobiles; in the 2003–2004 season, only one case every other day. However, visitation declined by approximately 37% from the previous winter. If visitation was assumed to be constant, then incidents involving snowmobile citations decreased 28%, cases involving moving violations 70%, and arrests 85%.

Table 15. Law enforcement statistics, 2002–2003 and 2003–2004 winter seasons.

	2002–2003	2003–2004	Percent change from 2002–03 to 2003–04	Expected 2003–04 cases if visitation were constant	Percent change from 2002–03 to 2003–04, assuming constant visitation
Cases	383	172	- 55%	240	- 28%
Arrests	21	2	- 90%	13	- 85%
Moving Violations	238	44	- 82%	149	- 70%

PARK STAFF AIR AND NOISE MONITORING SURVEY

From January 22 to 24, 2004, and February 14 to 16, 2004, IHI Environmental conducted air and noise monitoring to document Yellowstone National Park employee exposures associated with snowmobile operations. The air contaminants of interest for this survey included petroleum hydrocarbons, aldehydes, respirable particulate, and carbon monoxide.

Most of the exposure monitoring was conducted at the West Entrance station, however, some monitoring was done in the Madison warming hut, the Madison mechanic area, and the Old Faithful ranger station. At the West Entrance, samples were collected between 8 A.M. and II A.M., the period of heaviest snowmobile traffic. These exposures determined the employees' 8- hour time- weighted average exposures for comparison with OSHA's Permissible Exposure Limits (PELs). In addition to this long- term sampling, air samples were collected during the 15- minute period during which the highest air concentrations were likely to occur. Exposures measured over these 15- minute periods were compared with OSHA Short- Term Exposure Limits (STELs) where appropriate. Daily snowmobile entries at the West Entrance on sampling days ranged from a low of 163 snowmobiles and 11 snowcoaches (January 22) to a high of 307 snowmobiles and 23 snowcoaches (February 15).

IHI compared the results with OSHA standards, the American Conference of Governmental Industrial Hygienists' (ACGIG) threshold limit values, the National Institute for Occupational Safety and Health's (NIOSH) recommended exposure limits, and the Agency for Toxic Substances and Disease Registry Minimum Risk Levels (ATSDR MRLs). Concentrations of all pollutants were well below OSHA standards and the ACGIH and NIOSH recommended limits. However, the results occasionally may have exceeded the ATSDR MRLs for benzene and toluene. The highest concentration of benzene detected was .007 ppm as an 8- hr time weighted average (TWA) at a West Entrance kiosk. The ATSDR MRL for intermediate exposure (14–365 days) is .004 ppm. Toluene was also detected at the West Entrance; the highest measured value was 2.1 ppm as an 8- hr TWA. The ATSDR MRL for toluene is 1 ppm for acute exposure (1–14 days). These results are not definitive because the sampling techniques used by IHI may not match those called for by ATSDR. In addition, it is uncertain if the length of time employees were exposed to these pollutants was sufficient to exceed the MRLs.

An earlier study was done of employee exposure to air pollutants from only two- stroke snowmobiles, but different sampling methods were used, making direct comparisons difficult (Kado, 2001). For respirable fine particulates ($PM_{2.5}$) at the West Entrance, Kado reported 0.16 mg/m^3 (160 $/m^3$), compared to 0.6 in the IHI study. Kado found a maximum exposure to particulates of 0.16 mg/m^3 (160 $/m^3$), compared to 0.013 mg/m^3 in the IHI study. With respect to volatile organic compounds, Kado found .259 ppm for benzene in the West Entrance area, while IHI found .007 ppm for an 8- hour period. For toluene, Kado found 0.67 ppm at the West Entrance while IHI found 2.1 ppm for 8- hours of exposure. Additional sampling is needed using methods compatible with the various standards and comparable to previous work.

The IHI report also measured employee exposure to noise from all sources, including OSVs and other equipment. OSHA noise standards require that all employees who may receive noise exposures higher than the Action Level of 85 dBA at any time during the year must be included in a Hearing Conservation Program; if the Permissible Exposure Limit of 90 dBA is exceeded, engineering controls or hearing protection to reduce noise exposures are required. IHI measured noise exposure slightly higher than 82 dBA on two employees riding BAT snowmobiles. They concluded noise exposures would be in excess of the Action Level after riding BAT snowmobiles for more than four hours. IHI recommended making hearing protection devices, such as disposable ear plugs, available to employees, which the parks have done for many years.

AVALANCHE CONTROL

As documented in the Final EIS and Final SEIS and in supporting evaluations from OSHA, the health and safety risks of operating the avalanche control program in Yellowstone at Sylvan Pass are significant. Although mitigation measures have been established to reduce the dangers to employees and visitors, the risks remain extreme.

A 105mm howitzer on loan from the U.S. military is used for avalanche control. In a typical winter, about 10 missions are conducted, each firing about 20 rounds. A single avalanche control mission requires a 10- hour work day for 5 to 7 employees. They must pass through four active, uncontrolled avalanche zones to reach the howitzer. The howitzer location itself is vulnerable to both avalanches and rock fall, since the howitzer platform sits below a vertical face of unstable rock. The howitzer and ammunition storage have security concerns, and the primary and

backup howitzers are stored outside (Swanke, 2004; Yellowstone National Park, 2004; Ross, 2004).

Over the years, unexploded ordinance (duds) has accumulated. The number of duds is unknown, but ranges up to 75. The ammunition contains a mixture of explosives that are highly toxic to humans and the environment. The fate of the partial and unexploded ordinance and its toxic filler is unknown, but of concern in the Sylvan Pass area (State of Montana, 2004). In the past two years, intensive efforts have gone into locating duds, but only a small portion of the control area has been searched. One dud that occurred during the winter of 2003–2004 have not been located as of the writing of this EA. The issue of unexploded ordinances is particularly acute, as avalanches can bring duds down to the road area where they may be caught up in rotary snow plows. As evident in a July 2004 mud and rock slide on Sylvan Pass, the duds are also an issue in the summer. Before the 10,000 cubic yards of material could be removed from the road, it had to be painstakingly searched for duds (Swanke, 2004).

Overshooting the target zone has also occurred, which places shells onto national forest lands outside the park. The Shoshone National Forest backcountry is not secured from human entry prior to avalanche shooting, and no program is in place for dud recovery on the national forest (Swanke, 2004).

NATURAL SOUNDSCAPES

An important part of the NPS mission is to preserve or restore the natural soundscapes (also referred to as natural quiet) associated with units of the National Park System. The natural soundscapes are the unimpaired sounds of nature, and are among the intrinsic elements of the environment that are associated with the natural ecological functioning and purpose of a national park. They are inherent components of "the scenery and the natural and historic objects and the wild life" protected by the NPS Organic Act. Natural sounds and tranquility are major resources of many national parks and are valued by visitors. Increasingly, even parks that appear as they did in historical context do not sound as they once did. Natural sounds may be masked or obscured by a wide variety of human activities. NPS policy is to facilitate, to the fullest extent practicable, the protection, maintenance, or restoration of natural soundscapes in a condition unimpaired by inappropriate sounds. Every visitor who so desires should have the opportunity to enjoy natural soundscapes and to hear the sounds of nature without impairment.

The Final EIS (pages 158–171) describes the natural soundscape and explains sound levels, sound level changes and audibility; natural and human- generated winter sounds, and current sound levels relating to oversnow vehicles (OSVs). Information is provided on measurement of ambient sound levels and non- natural sounds at eight monitoring sites in the three park units. This information is incorporated by reference into this EA and briefly summarized here. An analysis of sound and impacts on the natural soundscape was prepared for the Final EIS, *Technical Report on Noise: Winter Use Plan Final Environmental Impact Statement* (Harris Miller Miller and Hanson, Inc., June 2001). For the Final SEIS, a report was prepared to document additional information and analysis related to the impacts of OSVs on natural soundscapes (Menge and Ross 2002). Additional information was gathered during acoustic measurements during the winter of 2003–2004 (Burson 2004).

The existing winter sound environment in each park is a varying combination of natural and non- natural sounds. During the winter, some natural sound sources present in the parks in

other seasons are absent, including insects, migrant bird vocalizations, and the rustling of leaves of deciduous trees. Background sound levels in wilderness or national park areas are often lower during the winter than during the other seasons (Gdual and Gudorf 1998; Foch 1999). Water flow in streams and rivers is lower than during the spring and summer, and ice and snow covering the water reduces emitted sound levels. However many natural sounds are present, including animals (e.g., bison, elk, coyotes, wolves, ravens, magpies, chickadees, gray jays), wind, rivers, streams, and waterfalls. In Yellowstone, the sound of thermal activity associated with hotpots and geysers is notable.

Non- natural sounds in the parks include human voices and sounds resulting from cross-country skiing, winter camping, utilities in developed areas, wheeled vehicles on plowed roads, snowmobiles and snowcoaches on designated groomed roads, and snowmobiles used by ice fishers on Jackson Lake in GTNP. Sounds from aircraft are present in the parks as a result of regular traffic associated with Jackson Hole Airport, high altitude commercial overflights, NPS flights for research or other park purposes, and air- tour, private, and charter flights.

Areas of primary concern for this analysis are those where sound from OSVs on groomed or ungroomed routes affects the natural soundscape within the parks. For purposes of this analysis, the existing sound environment is described in terms of the proximity to these routes. Although sounds from OSVs are audible within a relatively small portion of the parks' total acreage, they are significantly concentrated around travel corridors and park attractions and affect the areas most accessible by the vast majority of park visitors. Most areas used by visitors seeking solitude and quiet are in close proximity to travel corridors. Remote backcountry areas largely free of non- natural sounds are not practically accessible for most visitors.

Several studies were drawn upon to describe the existing natural background and non- natural sound levels in the parks. Three were conducted from 1994 to 1996 by Bowlby & Associates, Inc., as part of establishing the CDST; they examined the sound levels of wheeled vehicles, snowmobiles, and snowplanes in GTNP, along the Parkway road to Flagg Ranch, and in the southernmost part of YNP. Short- term samples of background sound level data were also collected (Bowlby & Associates 1994; 1995; and 1996). A fourth study, by Harris Miller Miller & Hanson Inc., and Bowlby & Associates, Inc., was conducted in February and March 2000 with two purposes: (1) measuring background sound levels in YNP and GTNP; and (2) assessing the sound impact of non- natural sounds, including snowmobiles, snowcoaches, snowplanes, automobiles, buses, and aircraft for the alternatives in the EIS (Harris Miller Miller & Hanson, Inc., 2000; Bowlby & Associates 2000). Results of these studies are reported in detail in the Final EIS.

A survey of sounds in Yellowstone was conducted by the Greater Yellowstone Coalition and the National Parks Conservation Association on President's Day weekend in 2000. It documented the percent of time OSVs were audible at 13 sites in the Lower, Midway, and Upper Geyser Basins, with sampling sites ranging from 0.5 to 2.5 miles from roads. At 11 of the sites, OSVs were audible 70% of the day, from 9:00 A.M. and 1:00 P.M. At 8 sites, snowmobiles were audible 90% or more of the day. The survey results support modeling analyses that conclude snowmobiles are audible both in frontcountry and backcountry locations. Further, the backcountry areas where snowmobiles were audible tended to be those most accessible to visitors pursuing non-motorized activities.

In February 2002, Harris Miller Miller & Hanson, Inc., and Jackson Hole Scientific Investigations conducted separate vehicle pass- by measurements of OSVs (Menge and Ross

2002; Daily 2002) to update data collected in 2000 for the EIS. It provided the opportunity to measure the sound levels from a wide variety of OSVs, including four- stroke snowmobiles. Results of the study are included in Chapter IV of the SEIS, and the technical report is in Appendix B of that document.

From December 2003 to March 2004, acoustic measurements were collected at five sites within 20 miles of Old Faithful (Burson 2004) to monitor the natural soundscape relative to the standards and thresholds outlined in the Final SEIS. The study followed the NPS acoustic sampling protocol as proposed by the NPS Natural Sounds Program (Ambrose and Burson 2004). Sound levels and recordings to identify sound sources were collected at Old Faithful and the Lone Star Geyser (one mile from the groomed roadway), along the main groomed travel corridor (Mary Mountain Trail and 2.3 miles west of Madison Junction), and 4,000 feet from the Old Faithful–Madison Junction Road. The data indicated that OSVs were audible for more than 60% of the day at Old Faithful, from 8 A.M. and 4 P.M. (Fig. 2 and 3).

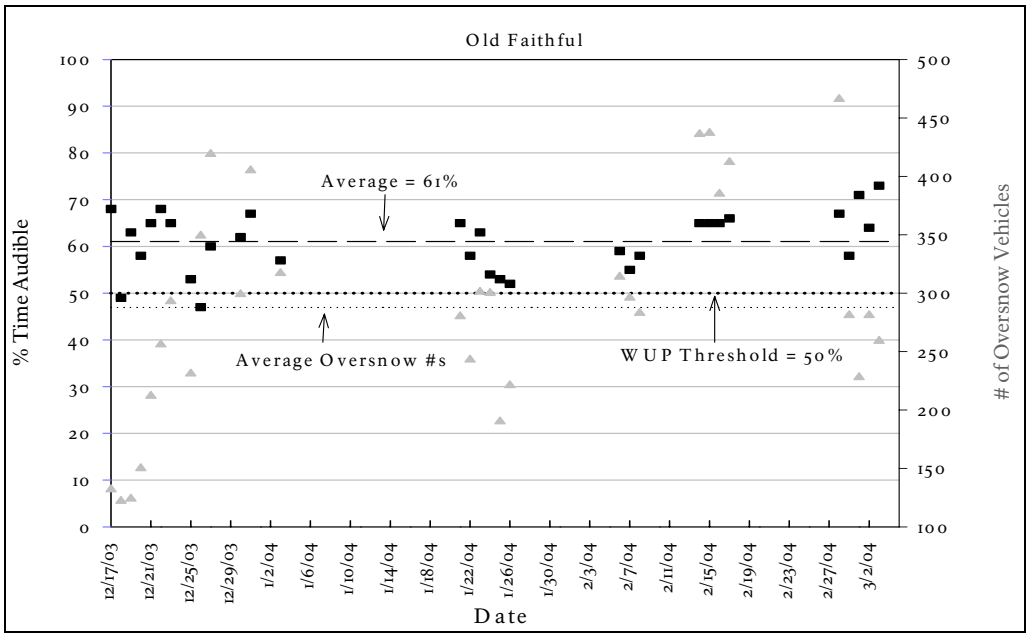

Figure 2. The percent time audible (black squares) and number of snowmobiles and snowcoaches (grey triangles) by date at Old Faithful from 8 A.M. to 4 P.M., December 17, 2003 to March 3, 2004. The "WUP Threshold" is the level identified in the SEIS winter use plan.

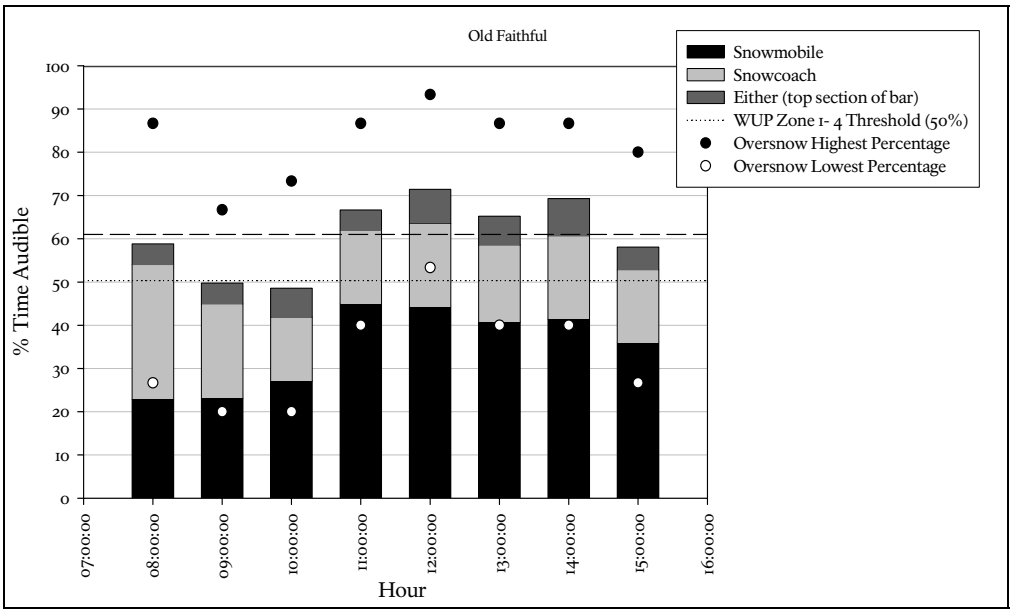

Figure 3. The average percent time audible by hour of snowmobiles and snowcoaches, and high and low range at Old Faithful from 8 A.M. to 4 P.M., December 17, 2003 to March 3, 2004.

Faint sounds from OSVs regularly extended at least one mile adjacent to the main motorized routes (Fig. 4). Monitoring was conducted on 18 days at Lone Star Geyser, which is along a groomed ski trail about one mile from the nearest road.

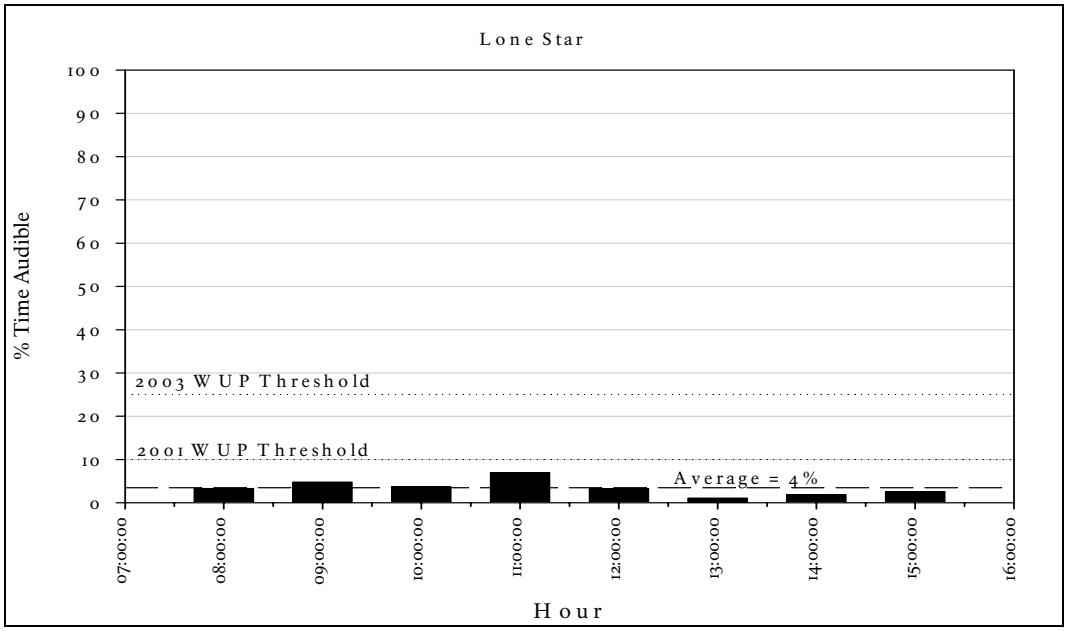

Figure 4. The average percent time audible by hour of snowmobiles and snowcoaches at Lone Star Geyser from 8 A.M. to 4 P.M., December to February 2004. The dotted lines indicate the 2001 and 2003 WUP thresholds.

Based on limited data from the previous winter, the sound level and the percent time OSVs were audible dramatically decreased from the 2002–2003 to 2003–2004 season (Fig. 5, 6, 7). This was largely a result of the decline in the number of snowmobiles present, the change from two- to four- stroke engine technology, and the 2003–2004 commercial guiding requirements, which tended to concentrate visitors into larger groups.

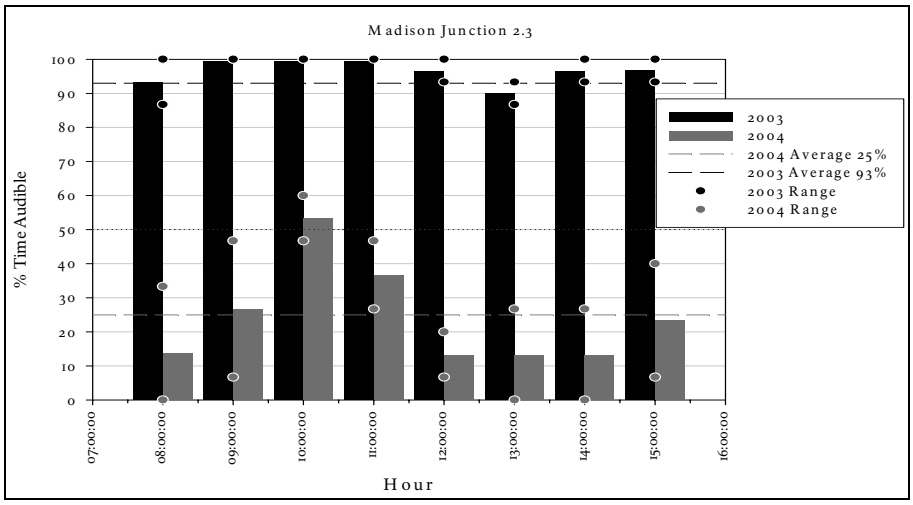

Figure 5. The average percent time audible and range by hour (8 A.M. to 4 P.M.) of snowmobiles and snowcoaches at 2.3 miles west of Madison Junction along the West Entrance Road during Presidents Day Weekend, 2003 and 2004. The dotted line indicates the WUP threshold for this management zone.

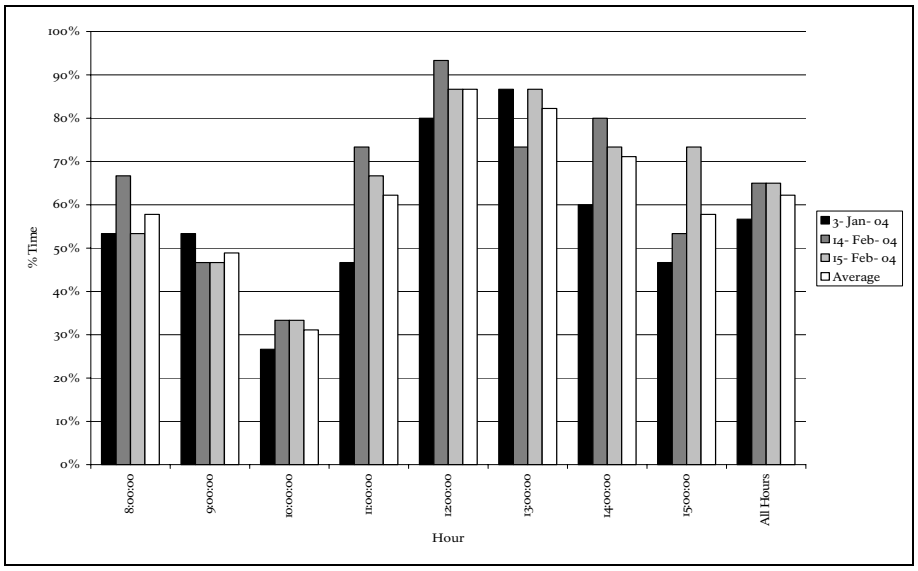

Figure 6. The average percent time audible by hour (8 A.M. to 4 P.M.) of snowmobiles and snowcoaches at Old Faithful on January 3 and Presidents Day Weekend 2004. Compare to Fig. 7.

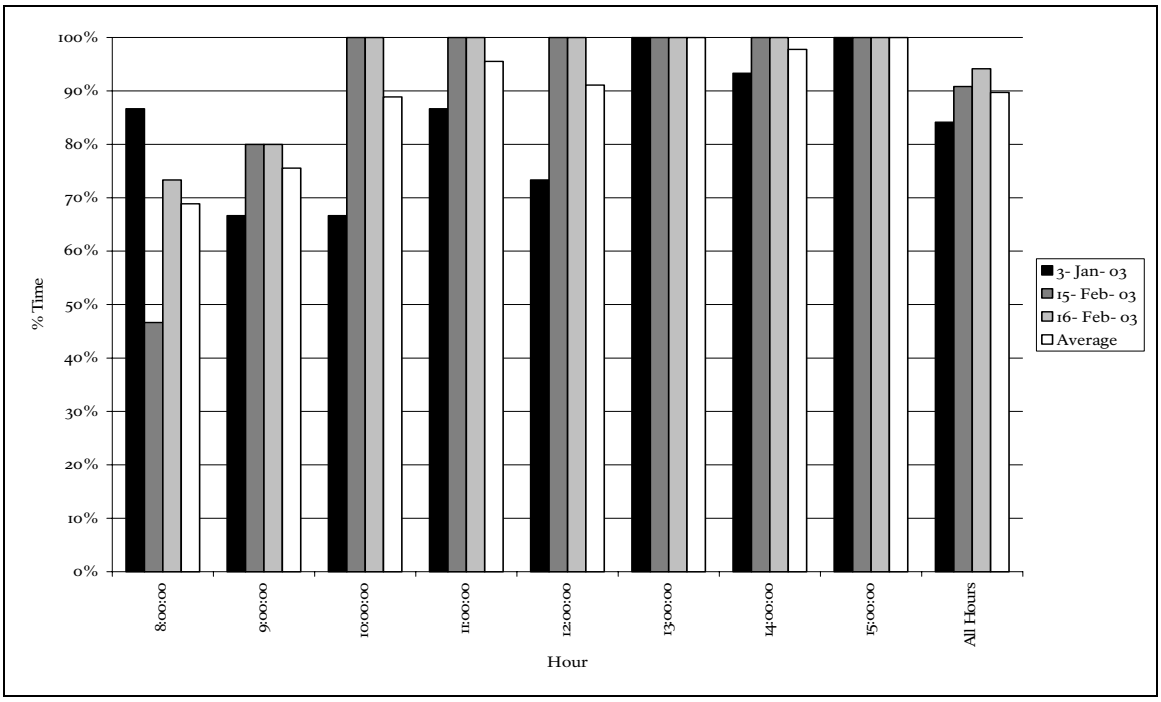

Figure 7. The average percent time audible by hour (8 A.M. to 4 P.M.) of snowmobiles and snowcoaches at Old Faithful on January 3 and Presidents Day Weekend, 2003. Compare to Fig. 6.

SOCIOECONOMICS

Extensive discussions of socioeconomics as part of the affected environment were included in the Final EIS (pages 106–122) and the Final SEIS (pages 105–110), and they are incorporated by reference here. Since the SEIS was completed, one new report regarding economics has been issued. RTI International, under contract with MACTEC Engineering and Consulting, Inc., BBL Sciences, and the NPS, conducted a winter visitor survey for the parks during the 2002–2003 season (National Park Service, 2003a). The survey was designed to provide information about recreational winter use of the parks; expenditures and trip characteristics of winter visitors; seasonal trips by snowmobile riders and other winter visitors to the parks and other sites in the region; the change in visitor welfare (consumer surplus) for day trips to the parks under different conditions, where the attributes of the trips are designed to capture the important effects of alternative winter management plans on winter visitor experience; and changes in visitation in response to alternative management plans based on the five alternatives in the Final SEIS.

Visitors to YNP were sampled throughout the season at the four entrances open during the winter (East, West, North, and South). A sampling plan was constructed to create a probability-based sample of winter visitors that could be weighted to reflect the true population of winter visitors to the park. Winter visitors to GTNP were sampled at the Taggart Lake parking lot according to a random sampling plan. The Taggart Lake lot is primarily used by cross- country skiers to access trails in GTNP.

The survey was designed using standard methods, including data from previous surveys, focus groups, and cognitive interviews. In addition, staff from YNP and GTNP, as well as expert survey consultants and the NPS Social Science Program provided input. Visitors were intercepted in the parks according to the sampling plan and asked to participate. Overall, 92% of visitors approached in YNP and 96% of visitors approached in GTNP at Taggart Lake agreed to participate in the survey. The visitors answered 2 or 3 short questions and provided their name and address. Visitors who provided their name and address were mailed the survey. In total, 80% of the surveys mailed to YNP visitors and 83% of the surveys mailed to GTNP visitors were returned.

In terms of demographics, winter visitors to the two parks are relatively more educated and wealthy than the general population. The majority of visitors to both parks are from western states. Forty- six percent of the Taggart Lake sample lived in Wyoming. The majority of visitors were employed and married, and the average age of visitors was in the mid- 40s. In YNP, 55% of the sample indicated that the primary activity on their trip was riding a snowmobile without a guide. Downhill skiing outside the parks was the next most popular primary activity (17% of the sample). In GTNP, 62% of those sampled chose cross- country skiing as their primary activity, and downhill skiing was the next most popular primary activity (14% of the sample). In the YNP sample, 15% was on day trips compared to 40% in the GTNP sample. Visitors on multi- day trips to both parks spent more time outside the parks than inside the parks during their trips.

Finally, survey participants were asked to name one thing they would change about their trip. In YNP, 40% said they would not change anything about their trip; 20% of non- snowmobile riders said they would have liked fewer snowmobiles in the park, and 14% of snowmobilers wanted smoother snow on the roads. At Taggart Lake, 60% of the sample would not change anything about their trip.

The survey contained several questions to address the impact of alternative management plans on winter use and to calculate the welfare impacts on visitors of changing conditions in the parks. To assess changes in visitation, the survey presented the respondent with one of three management plans and asked if they would visit more, the same number of times, less, or not at all if that plan were implemented. The three management plans were: banning snowmobiles; capping the number of snowmobiles each day; and both capping the number of snowmobiles allowed in each day and requiring all snowmobiles to be on a guided tour. For all types of visitors, the ban elicited the largest change in behavior, with a majority of snowmobile riders saying they would not visit. The majority of other visitors indicated they would not change or would increase their visitation if snowmobiles were banned. The policy of capping the number of snowmobiles allowed in the park each day (but not requiring guided tours) resulted in the smallest change in behavior, with 71% of the YNP sample and 74% of the GTNP sample responding that they would neither increase nor decrease their visitation under the policy.

An economic model was used to determine the financial impact of the alternatives to park visitors, referred to as "welfare changes." These were calculated using both the travel cost method and a stated preference conjoint experiment. The travel cost model was based on information about snowmobile trips to Wyoming, Montana, and Idaho in the 2000–2001 season. The stated preference conjoint experiment was designed to evaluate visitors' priorities in choosing a trip. Respondents were presented with a series of choices between two hypothetical trips or the option of not visiting the parks. The trips were described by nine attributes including activity, crowding, cost and other park conditions such as road condition, noise and exhaust fumes. This made it possible to calculate the changes in welfare that would result from changes

in park conditions. The data were estimated using conditional and mixed- logits. The results of the mixed- logit models were used to calculate welfare changes for sample management scenarios.

In general, policies that reduce crowding, noise, and emissions and improve road conditions resulted in welfare gains of between $100 and $350 per day for non- snowmobile riders. The gains were lower for snowmobile riders in some cases, especially snowmobile riders who own snowmobiles. For example, policies that require snowmobiles to be on guided tours result in welfare losses in most estimates. Banning snowmobiles in the parks resulted in a per day welfare loss of $32 for snowmobile riders in one model, while non- snowmobile riders had welfare gains of $330 to $430 per day.

The information in the survey was used to analyze the economic impacts of various snowmobile management plans to small entities. The results of that analysis are included in a separate report (National Park Service, 2003b).

Since the SEIS was completed, additional information on resort tax revenue in West Yellowstone, Montana, has become available. This complements information found in the Final SEIS, page 151 (Table 37).

Table 16. West Yellowstone tax collections and West Entrance visitation during the winter season.

Winter	West Yellowstone Tax Receipts	West Entrance Visits
2001- 2002	$536,996	70,371
2002- 2003	$476,037	49,703
2003- 2004	$401,664	28,880

(Source: Town of West Yellowstone, 2004)

VISITOR ACCESS AND CIRCULATION

Information on winter visitor access and circulation in the Final EIS (pages 175–184) and the Final SEIS (pages 129–131) is incorporated by reference into this EA and briefly summarized here.

Five gateway communities and park entrance stations provide local access to Yellowstone. The North Entrance is reached via U.S. Highway 89 through Gardiner, Montana, 54 miles south of Livingston, Montana. The Northeast Entrance is reached via U.S. Highway 212 from Silver Gate, Cooke City, Red Lodge, and Billings, Montana. The East Entrance is reached via U.S. Highway 16 from Cody, Wyoming, 53 miles east of the park. The Parkway (U.S. Highway 89/287) provides access from the south. U.S. Highways 20 and 287 provide access to the West Entrance through West Yellowstone.

Regional access to the Parkway is provided via U.S. Highway 287 from the Moran Entrance to GTNP on the east, and U.S. Highway 89 on the south from Jackson, Wyoming, through GTNP. GTNP administers the Parkway. Interstate 15 on the western edge of the region provides access to the park from Idaho Falls, Pocatello, and Boise, Idaho. Interstate 80 serves as a major east–

west connection for visitors entering the park from the south. The primary gateway community for GTNP is Jackson, Wyoming, about 3 miles south of the park boundary on U.S. Highway 89. Dubois, Wyoming, about 50 miles east of Moran along U.S. Highway 26/28, is a full service community through which all travel from the east must proceed, and through which people can access YNP, GTNP, and the Parkway as an alternative to traveling through Jackson. The northern access route, U.S. Highway 89/287, is closed in the winter to wheeled vehicles north of Flagg Ranch through YNP.

YNP roads are maintained for touring and sightseeing, accessing trailheads, and park management. During the winter, all park roads are closed to wheeled vehicular traffic except for Highway 191, which provides access between West Yellowstone and I- 90 near Bozeman, Montana, and the road from Mammoth to Tower to the Northeast Entrance (Cooke City). These two roads provide the only regional access through the park during the winter.

Visitors reach most interior park features via snowmobile, snowcoach, or cross- country skis. Many difficulties exist in serving winter visitors, including a shortage of all- weather facilities and the dangers of exposure to subzero temperatures. Staging areas for oversnow routes into the park typically include a parking area, and they may have restrooms, a warming hut, and snowmobile rental facilities. Concession- operated snowcoaches provide access to the park from some staging areas. The staging areas for trips into YNP are near Mammoth Hot Springs in the north, at Pahaska Teepee in the Shoshone National Forest near the East Entrance, at a parking area just north of Flagg Ranch near the South Entrance, and in the city of West Yellowstone near the West Entrance. These staging areas become congested during peak days because of small or undefined parking and unloading areas.

The travel routes in the parks are listed in Table 17. Each travel segment, and the features associated with it, is described in the Final EIS.

Table 17. Winter travel segments in the three park units.

Segment/Area	Description	Length (miles)
Canyon Village to Norris Junction	Groomed snow road	13.1
Mammoth Hot Springs to Norris Junction	Groomed snow road	22.6
Mammoth Hot Springs to North Entrance	Plowed route	4.8
Mammoth Hot Springs to Tower Junction	Plowed route	18.5
Tower Junction to Northeast Entrance Station	Plowed route	32.7
Tower Junction to Canyon Village	Closed to motorized use except for four miles from Canyon to Washburn Hot Springs	18.2
Canyon Village to Fishing Bridge	Groomed snow road	15.7
Fishing Bridge to East Entrance	Groomed snow road	25.4
Fishing Bridge to West Thumb	Groomed snow road	20.0
West Thumb to South Entrance	Groomed snow road	22.0

Segment/Area	Description	Length (miles)
West Thumb to Old Faithful	Groomed snow road	17.8
Old Faithful to Madison Junction	Groomed snow road	16.6
Madison Junction to West Entrance	Groomed snow road	13.7
Madison Junction to Norris Geyser Basin	Groomed snow road	13.7
YNP South Entrance to Flagg Ranch	Groomed snow road	2.0
Flagg Ranch to Parkway west boundary (Grassy Lake Road)	Groomed snow road	7.6
Flagg Ranch to Colter Bay	Plowed highway, adjacent groomed route	15.6
Colter Bay to Moran Junction	Plowed highway, adjacent groomed route	10.2
Moran Junction to east GTNP entrance	Plowed highway, adjacent groomed route	2.0
Moran Junction to south GTNP entrance	Plowed highway	26.0
Teton Park Road	Non- motorized route	15.0
Gros Ventre Road	Plowed road	13.0
Moose- Wilson Road	Plowed road from both ends, 1.5 miles non- motorized	7.0
Jackson Lake	Area closed to snowplanes	N/A

The Parkway encompasses 24,000 acres between YNP and GTNP, including the 7.5- mile road from YNP to GTNP, which passes Flagg Ranch. The road is groomed from YNP to Flagg Ranch and plowed south of Flagg Ranch to GTNP. The CDST, which parallels the road between the east boundary of GTNP and Flagg Ranch, is accessed from trail systems on the adjacent Shoshone and Bridger- Teton National Forests out of Jackson and Dubois. Grassy Lake Road, beginning at Flagg Ranch and continuing west outside the Parkway boundary into Targhee National Forest, is groomed for oversnow travel.

Winter lodging facilities in YNP provide a total of 256 rooms with 413 beds in two lodging facilities: Mammoth Hot Springs Hotel and cabins, and Old Faithful Snow Lodge and cabins. In addition to these facilities, Yellowstone Expeditions has yurts near Canyon Village, and the park also issues winter backcountry camping permits.

Warming huts in YNP are located at Mammoth, Canyon Village, Indian Creek, Fishing Bridge, Madison, Old Faithful, and West Thumb. A new warming hut has been approved and is planned for Norris. The Canyon Village, Old Faithful, and Madison warming huts are scheduled for replacement. Warming huts at Mammoth, Madison, and Canyon Village locations are staffed by concession personnel who operate small snack bars and maintain vending machines. Some of the huts are also staffed by NPS interpreters, who answer questions and provide information and other assistance to visitors. Snowcoaches, which operate from Mammoth Hot Springs, Old Faithful, West Yellowstone, and Flagg Ranch (the Parkway), offer cross- country skiing tours, snowshoe tours, and sightseeing tours.

For GTNP and the Parkway, Flagg Ranch and Triangle X provide overnight accommodations during the winter. Visitor facilities at Signal Mountain, Colter Bay, and Jackson Lake lodge are closed during the winter. Flagg Ranch is the major staging area for oversnow travel from the south to YNP. Dornan's, a park inholder at Moose Junction, is open year- round and offers lodging, dining, general store, gas, and visitor information in the winter. Park headquarters and

the Moose Visitor Center, located across the Snake River just west of Moose Junction, are open in the winter.

SNOWCOACH VISITATION

Snowcoaches have been used in Yellowstone since the mid- 1950s, well before snowmobiles first arrived on the scene in the early 1960s. Businesses in surrounding communities, especially West Yellowstone, have run touring enterprises based exclusively on providing snowcoach tours. In fact, some of these businesses have been able to turn a profit using some of the original snowcoaches that first entered Yellowstone, restoring the vehicles as needed. Many of the first snowcoaches were manufactured by the Bombardier Company of Valcourt, Quebec, Canada. Bombardier ceased production of the vehicles in the 1980s, although the assembly line remains intact.

Since that time, businesses have experimented with various other snowcoaches, primarily using 15- passenger vans that have been converted to run on snow- covered roads with track and ski assemblages. While such snowcoach conversions were initially prone to breakdowns, their operators have significantly improved their reliability through stronger transmissions, better maintenance, and alternative track and/or ski combinations. Many such van conversion snowcoaches are accessible to the handicapped.

Snowcoach operation and speed depend upon a variety of conditions, especially weather and snow conditions. They are slow in some conditions, as when a blanket of heavy, wet snow falls upon the park. Under most winter conditions, however, they can maintain speeds of 25 to 30 miles per hour, a speed at which most visitors enjoy touring the park.

Snowcoach travel enables visitors to tour the parks with knowledgeable guides who enjoy sharing their knowledge. Snowcoach schedules almost always incorporate time for wildlife viewing and scenery photography. While some visitors regret the loss of freedom in snowcoach travel, others appreciate the learning opportunities and the heated, enclosed comfort of a snowcoach.

Since the Final SEIS was released, contracts have been signed that authorize 16 businesses to operate a specified number of snowcoaches for tours of YNP for 10 years (Table 18). Businesses that wish to increase their snowcoach operations may do so with park approval, and two businesses did this at the end of the 2003–2004 season. A total of 78 snowcoaches are currently authorized to operate in YNP. Given that each snowcoach can carry from 8 to 12 visitors, approximately 800 visitors may be accommodated per day with the current concessioner snowcoach fleet. Additional snowcoaches could be approved if warranted by customer interest.

Table 18. Businesses authorized to provide snowcoach services in Yellowstone National Park.

Concessioner	Snowcoaches Authorized
Parkwide	
Xanterra Parks and Resorts	29
West Entrance	
Backcountry Adventures	2
Buffalo Bus Touring Company	6
Loomis Enterprises, Inc.	4
Yellowstone Alpen Guides	10
Yellowstone Expeditions	6
Yellowstone Tour and Travel	6
South Entrance	
Cache Creek Snowmobile Tours	2
Goosewing Ranch	2
Rocky Mountain Snowmobile Tours	2
Triangle C Ranch	2
Yellowstone Explorers	2
North Entrance	
Loomis Enterprises	3
East Entrance	
High Country Adventures	2
Total	**78**

NEW GENERATION SNOWCOACH – "THE NEW YELLOW BUS"

Yellowstone and Grand Teton are working with the U.S. Department of Energy's Idaho National Engineering and Environmental Laboratory (INEEL), the automotive industry, and other private companies to develop a new generation snowcoach for use in the parks. The prototype wheeled vehicle debuted in Yellowstone in August 2003 and was tested at locations around the country in the summer and fall of 2003. The vehicle was tested on tracks as a snowcoach in the 2003–2004 season and modifications are being made based on the testing and field reviews. A model of the vehicle will be in operation during the winter of 2004–2005.

The new snowcoach is a 16- to 18- passenger mid- sized bus with a quiet diesel engine that can use either petro- diesel or bio- diesel fuel and is capable of meeting 2007 clean diesel requirements. In the summer, the vehicle operates on wheels; in the winter, tracks replace the wheels. As a wheeled vehicle it complies with the Americans with Disabilities Act; its low floor eliminates the need for steps and it has an entry ramp that can be extended to accommodate passengers in wheelchairs. In the winter, with the ramp, accessing the vehicle requires only one step rather than three or four with a normal bus. The vehicle has very large side windows for excellent viewing, and enhanced heating and air conditioning systems to keep the vehicle well ventilated in summer and winter. It can be equipped with a roll- back top to give it an open roof similar to the historic red and yellow buses that the new snowcoach is patterned after, and an enhanced audio system for communication between the driver and passengers.

The vehicle chassis and power train are designed for the medium duty bus market, and market analysis indicates that a low emission, fuel efficient vehicle will have broad application in municipal transit and private- sector transportation. Seating configuration and materials and all other interior amenities are options depending on the end user's needs. This is making it possible to develop a vehicle at much lower cost than a park- specific bus. Funding was provided by Congress in Fiscal Year 2004 to purchase six vehicles along with support infrastructure. The Department of the Interior has requested additional funding in the Fiscal Year 2005 appropriation. These initial vehicles would be used as administrative vehicles by the NPS at Yellowstone and Grand Teton, and for further testing and refinement of the vehicles.

WINTER VISITATION DATA

Information on winter visitation may be found in the Final EIS (pages 184–190) and is incorporated by reference in this EA. This section provides updated statistics for the winter seasons of 2000–2001 through 2003–2004.

WINTERS OF 2002–2003 AND 2003–2004

The 2002–2003 and 2003–2004 winter seasons were somewhat different than previous winters in the parks. Visitation via snowmobile, the most common method of visiting the parks, was 24% less than the 10- year average during the 2002–2003 season, and it continued to decline in 2003–2004, when it was 61% less than the 11- year average (1992–2003). These declines were probably a result of the uncertainty about winter use of the parks. There was a great deal of confusion about how to visit the parks in winter, and whether the parks were even open.

During the winter of 2003–2004, snowmobiles operated under strict limitations for the first time as a result of two federal court orders, as discussed in Chapter I. On February 10, the NPS issued new orders that allowed more snowmobile use for the rest of the season. Table 19 lists the snowmobile limits by entrance under both sets of limitations, along with the ten- year average number of snowmobiles that previously entered each entrance, important in understanding how the limits affected visitation.

Table 19: Daily snowmobile entrance limits and actual snowmobile use during the 2003–2004 season as compared to the 10- year average.

	Pre- Feb. 10 limit	Post- Feb. 10 limit	10- year average	Pre- Feb. 10 average	Post- Feb. 10 average	Daily average for season
West Entrance	278	400 (122 BAT)	538	153	188	166
North Entrance	60	60 (20 BAT)	16	10	8	9
East Entrance	65	100 (55 BAT)	35	10	9	9
South Entrance	90	220 (130 BAT)	176	60	95	73
CDST	25	50	25	2	2	2
Grassy Lake Road	25	50	25	9	6	8

	Pre- Feb. 10 limit	Post- Feb. 10 limit	10- year average	Pre- Feb. 10 average	Post- Feb. 10 average	Daily average for season
Jackson Lake	0	40	25	0	15	6

Notes: All snowmobiles entering Yellowstone during the 2003–2004 season had to travel with a commercial guide, but no BAT requirements applied until February 10. After that date, a portion of the snowmobiles entering Yellowstone had to meet BAT requirements, as shown above. In GTNP, no commercial guiding or BAT requirements applied during the 2003–2004 season. Twenty- five snowmobiles were available for rent at Old Faithful, and these were counted against the North Entrance's daily entrance limits. These rental snowmobiles are not included in the North Entrance's average figures.

The 2003–2004 daily entry limits allowed at least historical snowmobile use to occur except at Yellowstone's West and South Entrances. At the West Entrance, the busiest, both the pre-February 10 and post- February 10 entry limits were substantially less than the 10- year average use. At the South Entrance, the second busiest, the daily entry limits before February 10 were substantially less than the 10- year average, but somewhat greater than the 10- year average after February 10.

Overall for Yellowstone, visitation during the 2003–2004 season averaged 259 snowmobiles per day in January and February, about one third of the historical average of 765 snowmobiles per day. The parkwide daily limits of 493 or 720 were never reached; the maximum number of snowmobiles that entered Yellowstone on any one day was 438. Nor were the daily limits ever met at any entrance, although the South Entrance was coming close until the limit changed on February 11. This illustrates that despite the institution of the daily entry limits, the parks were able to satisfy visitor demand for snowmobile use on every day of the winter season. However, after the daily limits increased on February 11, the previous limits were exceeded on four days at the West Entrance and 19 days at the South Entrance. These numbers partly reflect the fact that visitation to the parks in February and March is usually greater than that in December and January, but it is important to note that without the increase in the daily limit, on some days some visitors would have been unable to enter the park via snowmobile at their preferred entrance. Other entrances had sufficient capacity, but it is not always convenient to enter through a different park entrance because of the distances involved in driving from one entrance to another.

To some extent, then, the daily entry limits did not play a significant role in limiting visitation during the 2003–2004 season. Visitation also declined during the previous season, which did not have any entry limits. The decline in visitation for both the 2002–2003 and 2003–2004 winter seasons was at least partly the result of the great uncertainty among the public about winter use management. Although the NPS tries to convey that the parks remain open for winter visitors, this message is difficult to get across amid the controversy and ongoing litigation associated with winter use management. Even if a new winter use plan was adopted that allowed higher daily limits, snowmobile visitation might take several seasons to reach them.

HISTORICAL VISITATION PATTERNS

During the winter, visitors enter YNP primarily on snowmobiles (62%), automobiles and buses (29%), and snowcoaches passengers (9%). Only 1% of visitors enter on cross- country skis, but

20% of all Yellowstone visitors participate in cross- country skiing while in the park. Table 20 shows winter visitation by mode of entry starting with the 2000–2001 season, for prior years see the Final EIS.

Table 20. Mode of winter arrivals in Yellowstone National Park.

Winter Season	Number of Visitors Entering the Park						Total Visitors
	Auto	RV	Bus	Snowmobile	Snowcoach	Skiers[1]	
2000–2001	88,102	138	3,071	84,473	11,683	389	184,188
2001–2002	47,750	215	417	87,206	11,832	307	144,490
2002–2003	41,666	278	796	60,406	12,154	322	112,741
2003–2004	42,643	181	1,141	30,437	14,823	438	85,984
Total 1992–2003	418,703	1,844	7,779	870,447	127,148	5,981	1,425,784
Average per season	38,064	168	707	79,132	11,559	544	129,617
Percent of total visitors	29%	<1%	<1%	61%	9%	<1%	100%

[1] This only includes visitors who ski through a park entrance; it does not reflect the total number of people who ski while visiting Yellowstone.

The West Entrance is the busiest park entrance; 48% of winter visitors since the winter of 1989–1990 have come through it. The North Entrance use is next highest at 31%, followed by the South Entrance Station with 19% and the East Entrance with 3%. Table 21 shows visitor counts by entrance station starting with the 2000–2001 season, for prior years see the Final EIS.

Table 21. Winter use visitors in YNP by entrance station.

Winter Season	North	West	South	East	Total
2000–2001	43,226	66,468	24,718	4,380	138,792
2001–2002	48,387	70,371	21,432	4,300	144,490
2002–2003	42,744	49,703	17,378	2,916	112,741
2003–2004	43,968	28,880	8,491	1,006	82,345
Total 1992–2004	589,457	861,848	322,916	54,504	1,828,725
% of Total Visitors	32%	47%	8%	3%	100%

The North Entrance is the only Yellowstone entrance that is accessible to wheeled vehicles during the winter season, and nearly all of the visitors coming in the North Entrance arrive by auto. The primary attractions accessible from the North Entrance during the winter are Mammoth Hot Springs, with its associated facilities and nearby cross- country skiing, and the Lamar Valley, with its opportunities to view wolves. Table 22 shows visitor counts by activity at the North Entrance starting with the 2000–2001 season, for prior years see the Final EIS.

Table 22. Winter visitation by activity, Yellowstone North Entrance.

Winter	Visitors by Auto	Recreation Vehicle	Bus Passengers	Skiers	Snowmobile Passengers	Snow-coach Passengers	Total Visitors
2000–2001	38,538	139	543	7	1,758	2,241	43,226
2001–2002	47,750	215	417	5	1,225	2,012	48,387
2002–2003	41,666	278	796	4	878	2,003	42,744
2003–2004	42,643	181	1,141	3	1,094	2,496	43,968
Total 1992–2004	461,346	2,025	6,392	123	16,559	26,690	503,427
% of Total Visitors	92%	<1%	1%	<1%	3%	5%	100%
Average per Season	38,445	169	533	10	1,380	2,224	41,952

At the West Entrance, about 90% of the winter visitors arrive on snowmobiles. Table 23 shows visitor counts by activity at the West Entrance starting with the 2000–2001 season, for prior years see the Final EIS.

Table 23. Winter visitation by activity, Yellowstone West Entrance.

Winter	Skiers	Snowmobile Passengers	Snowcoach Passengers	Total Visitors
2000–2001	67	58,292	8,109[1]	66,468
2001–2002	6	64,063	6,302	70,371
2002–2003	69	42,540	7,094	49,703
2003–2004	103	20,028	8,749	28,880
Total 1992–2004	384	624,731	79,438	704,553
% of Total Visitors	<1%	89%	11%	100%
Average per Season	32	52,061	6,620	58,713

[1]This number includes visitors who arrived by bus in March after the road was plowed; the West Entrance was closed to oversnow traffic on February 25 because of unsafe conditions.

Visitation at the East Entrance has also been primarily by snowmobile. Table 24 shows visitor counts by activity at the East Entrance starting with the 2000–2001 season, for prior years see the Final EIS.

Table 24. Winter visitation by activity, Yellowstone East Entrance.

Winter Season	Skiers	Snowmobile Passengers	Snowcoach Passengers	Total Visitors
2003–2004	255	1,006	159	1,420
2002–2003	196	2,720	0	2,916
2001–2002	236	4,064	0	4,300
2000–2001	197	4,183	0	4,380
Total 1992–2004	4,773	38,431	264	43,468
% of Total Visitors	11%	88%	<1%	100%
Average per Season	398	3,203	22	3,622

Visitors to YNP enter the South Entrance first travel through GTNP and the Parkway. The Final EIS displayed a table containing visitation by activity for the South Entrance station from 1992 through 2000; Table 25 updates that table with information from the ensuing winters. As with the entrances other than the North Entrance Station, snowmobiles are the primary mode of transportation. The South Entrance Station had the second highest number of snowcoach passengers and snowmobiles during the reported winters. The South Entrance is not accessible to wheeled vehicles.

Table 25. Winter visitation by activity, Yellowstone South Entrance.

Winter Season	Skiers	Snowmobile Passengers	Snowcoach Passengers	Total Visitors
2003–2004	77	8,223	3,437	11,737
2002–2003	53	14,268	3,057	17,378
2001–2002	60	17,854	3,518	21,432
2000–2001	119	20,738	3,861	24,718
Total 1992–2004	1,130	220,919	38,002	260,051
% of Total Visitors	<1%	85%	15%	100%
Average per Season	94	18,410	3,167	21,671

GTNP visitor counts include visitors using the John D. Rockefeller, Jr., Memorial Parkway. Flagg Ranch, a commercial operation licensed to provide visitor services that complement winter use activities, offered accommodations in the Parkway through March 2003, but only snowmobile rentals and minor visitor services last winter. The Parkway accommodated a total of 244,023 snowmobile visitors for the eight seasons starting December 1993, with an annual average of 22,184.

Visitor counts for GTNP also include snowmobilers using the CDST. This groomed trail is located adjacent to Highways 26/287 and 89/191/287 and traverses the 27 miles between the park's East Entrance and Flagg Ranch.

Table 26. Winter use by activity in Grand Teton and the Parkway, 1993–2004.

Winter Season	Parkway Snowmobile	CDST Snowmobile	GTNP Snowmobile	GTNP Snow-plane	Parkway Skiing	GTNP Skiing	Total Visitors
1993–1994	31,268	N/A[1]	1,222	1,891	1,548	7,875	43,804
1994–1995	25,016	1,394	1,113	1,627	1,694	4,723	31,204
1995–1996	18,004	2,309	2,941	1,384	1,231	6,599	28,735
1996–1997	19,887	1,930	3,643	1,440	1,294	5,962	30,512
1997–1998	19,597	1,857	3,951	1,485	1,185	4,151	28,593
1998–1999	17,160	1,639	3,436	851	1,149	4,242	26,349
1999–2000	23,400	1,329	4,800	1,091	1,581	5,687	35,654
2000–2001	31,011	1,307	2,618	1,148	1,987	4,774	42,845
2001–2002	26,401	2,006[2]	3,421	1,299	1,842	7,346	42,315
2002–2003	23,062	1,752[2]	2,305	0[3]	2,099	7,007	36,225
2003–2004	9,217	139	1,939	0	1,389	8,000[4]	20,684
Total	244,023	15,662	31,389	12,216	16,999	66,366	366,920
Percent	67%	5%	9%	4%[2]	5%	18%	100%
Average	22,184	1,566	2,854	1,357[2]	1,545	6,033	33,356

Source: Data obtained from NPS visitation records.

[1]CDST opened this year; visitor usage records were not available.

[2]Estimate based upon previous average percentage of Parkway users.

[3]Snowplane use on Jackson Lake was prohibited after the 2001–2002 season; average and percent of total reflect usage up through that season.

[4]Exact count is unavailable; this figure represents a best estimate.

VISITOR EXPERIENCE

Information on the winter visitor experience may be found in the EIS (pages 190–196) and the SEIS (pages 134–141) and is incorporated here by reference. Since the SEIS was completed, an additional visitor survey has been completed (National Park Service 2003a). The survey results are summarized above in the section on socioeconomics.

WILDLIFE

Winter for wildlife in the GYA is a challenging time for survival. Deep snow, cold temperatures, and lack of high quality forage can lead to synergistic and nutritional stress, and, consequently, intense competition and higher rates of mortality. Human activities in the winter may compound these factors. This section of the EA describes the animal species that winter recreation is most likely to affect and those for which new information has become available since the publication of the Final EIS, specifically bison and elk. The Final EIS (pages 143–158) and the Final SEIS (pages 117–127) contain extended descriptions of other species, including population status or trend (if known), relevant life history data, and information on winter habitat use.

LYNX

Potential effects of winter use management alternatives include (1) barriers to travel across roads due to heavy oversnow traffic, (2) mortality of Canada lynx due to vehicle strikes, (3) reduction in suitable habitat due to vehicle noise and human activity in the vicinity of roads and developed areas, and (4) increased access to Canada lynx habitat by other species that may compete for food or prey on lynx (Ruediger et al. 2000). The 2003 FWS Biological Opinion found the action would not jeopardize the continued existence of the species (see explanation above under "Federally Protected Species"). New information and analyses, i.e., documented lynx presence and identification of lynx analysis units (LAUs) and linkage areas, are available from the two parks since completion of the SEIS.

Both parks have now identified LAUs as described in the Lynx Conservation and Assessment Strategy. In Yellowstone, roads that may be used by OSVs transect the Tower Creek, Clear Creek, Middle Creek, and Bechler LAUs. Lynx were recently detected in the Clear Creek and Middle Creek LAUs, and in the central portion of the park outside LAUs (Murphy et al. 2004). Eight key linkage areas transected by major park roads may be used by resident or dispersing Canada lynx. Three linkage areas that are transected by parks roads are available for travel by OSVs in the proposed alternatives for winter use.

In Grand Teton, roads that may be used by over- snow vehicles transect the Two Ocean, Steamboat, Webb, and Granite LAUs. Lynx have not been recently detected during surveys of Grand Teton (Pyare 2001), and none of the linkage areas mapped in the park are transected by roads available for oversnow travel.

The proposed intensity of road use by OSVs, including the East Entrance road that transects the Middle and Clear Creek LAUs, is insufficient to inhibit lynx movements across roads and use of habitats in the vicinity of roads, and is very unlikely to cause mortalities due to vehicle strikes. Canada lynx probably do not avoid roads, except at traffic volumes exceeding 2,000 to 3,000 vehicles per day. However, peak daily traffic on any roads open to oversnow travel will be far less than 2,000 vehicles per day in the proposed alternatives, particularly in the LAUs. Road densities in the parks seldom exceed two miles per square mile, the level above which the LCAS advises land mangers to reduce anthropogenic disturbance by closing roads (Ruediger et al. 2000). No net increase in winter road mileage is proposed by the alternatives. Winter use activities allowed by the alternatives concentrate potential disturbance along roads and in developed areas. Off- road travel is not permitted in either park. Fatal vehicle strikes for lynx on roads have been reported in the contiguous U.S. (Theil 1987, Staples 1995), but no road- killed lynx have been documented in the GYA, undoubtedly because lynx are rare (Halfpenny et al. 1999). Backcountry travel in LAUs, including Middle and Clear Creeks, is uncommon and insufficient to increase competition between lynx and other predators. Moreover, lynx have not been shown to be adversely affected where access to lynx habitat by other predators is facilitated by snow trails compacted by backcountry users.

UNGULATES OF CONCERN

Ungulates rely on restricted winter ranges in which food and cover may be limited. Major episodes of winter stress, low forage availability, and declining physiological conditions lead to increases in mortality (Meagher 1998). Competition is particularly severe in winter, when thousands of large ungulates move to lower elevations to forage on exposed vegetation in areas

with less snow (Clark 1999). Concern over the loss of elk winter range in Jackson Hole resulted in the creation of the National Elk Refuge in 1912, to which a great many elk now migrate before the winter recreation season begins. The Jackson Hole Cooperative Elk Studies Unit believes that winter range is one of the most critical issues involving successful management of the second largest elk herd in the world.

In YNP, thermal areas are important components of winter range because warm ground keeps these areas relatively free of snow (Meagher 1970, 1971, 1976, 1978, 1985, 1998; Murie 1940; Miller 1968; Craighead et al. 1973; Ables and Ables 1987; NPS 1990b). During severe winters, valleys that can support bison have either extensive thermal or warm areas, or many small thermal areas among which bison movement is possible. Streams that remain unfrozen because of an influx of warm water are another feature of most bison wintering areas in the park. Meagher (1978) wrote "Scattered thermal sites—particularly warm ground with less snow—apparently provide a margin for survival for bison in the harshest wintering areas of YNP." As reported in a number of studies since 1973, thermal areas with snow- free vegetation or shallow snow are also very important winter habitats for elk along the Madison, Firehole, and Gibbon Rivers (NPS 1990b).

Bison

Bison are native to the GYA, and were observed by early travelers before and after the creation of YNP in 1872. In the 1870s and 1880s, bison were nearly driven to extinction by market hunting. By 1902, only 23 bison were counted in the park. Park managers began a program to restore the bison population, which included the introduction of bison from captive herds. From the 1920s to the late 1960s, bison in the park were subject to herd reductions and other manipulation to achieve range management goals. In 1967, this was discontinued and a policy of natural regulation was established that allows bison and other ungulates to reach population levels dictated by environmental conditions. As of summer 2004, the Yellowstone bison population is at a sound ecological level, with a population estimate of 4,200- 4,800 individuals.

As a result of significant increases in bison numbers and their movement from the park into Montana, periodic removals were resumed in 1990. The risk of transmission of brucellosis—a contagious bacterial disease—from bison to cattle and the economic cost associated with this risk prompted the development of various bison management plans. A Final Environmental Impact Statement/Plan for bison management was released in 2000. Management removals to prevent the transmission of brucellosis to cattle and severe winter conditions are now the main causes of bison mortality. Bison die during major episodes of winter stress, low forage availability, and declining physiological conditions (NPS 1998). Their carcasses are scavenged by many species, including mammals, birds, and insects, and thus play an important role in the ecology of the parks (NPS 1998). In particular, bison carcasses provide protein for threatened species including grizzly bears, bald eagles, and gray wolves (Swenson et al. 1986; Green et al. 1997; Smith et al 1998).

The groomed road system of YNP and its effect on bison population dynamics remains a matter of debate. According to bison researcher Dr. Mary Meagher, bison began using the snowpacked groomed roads to expand their range and facilitate dispersal into new areas. Historically, bison winter range was located in the Lamar Valley, Pelican Valley, and the area from Hayden Valley to the Firehole (Mary Mountain). Taper et al. (2000) report that there was little population transfer between these major geographic wintering areas of the north (Lamar Valley) and central (Pelican Valley and Mary Mountain) regions. Beginning in February 1980, aerial surveys reported mixed groups of bison traveling from the geothermal areas on lower Pelican Creek to

areas west of Mary Bay, adjacent to the snow- packed road. In February 1981, bison were reported for the first time near the mouth of Pelican Creek, suggesting a winter range expansion In both cases, there was no evidence in the snow that bison had moved from the main valley southwest down Pelican Creek to the road, indicating that the bison had accessed this location by using the snow- packed road west from Mary Bay. By the mid- 1980s, it was increasingly apparent that Pelican Valley bison were moving all the way to Hayden Valley during the winter. The snow- packed road that follows the Yellowstone River along the west bank appeared to serve as the main travel corridor between the Fishing Bridge–Lake Road junction and Hayden Valley (Meagher et al 2002).

In February 1982, small mixed groups of bison were observed at Madison Junction. Because the snow- covered road was packed between the Firehole and Madison Junction, no travel trails had to be created through unbroken snow. This became an annual occurrence after 1982 (Meagher et al 2002). Beginning in 1989, there was an increase in bison use of the west side of the park, with a minimal decrease in winter use of the Hayden Valley, which suggested that bison traveling from Pelican Valley were displacing bison from the Hayden Valley into the Firehole area. These increased numbers on the Firehole may have led to a shift of bison westward and northward beyond the Firehole (Taper et al. 2000).

Cheville et al. (1998) presents an alternative interpretation of the population data. They conclude that the population growth rate and range expansion did not increase as a consequence of the groomed road system. Rather, range expansion is an artifact of a population that does not regulate naturally. They concluded that even in the absence of groomed roads, it would be unlikely that natural mortality would eliminate the egress of bison from the park. Other researchers dispute Meagher's claim of range expansions into the Firehole, Madison, and Hayden Valleys, stating that these areas were traditionally used by bison since at least the early 1970s (Craighead et al. 1973; Aune 1981). Aune (1981) asserts that the range expansions which began in the late 1970s include more movement out of the northern area where no groomed routes exist and into Cougar Meadows and West Yellowstone. Studies by Bjornlie (2000), Kurz et al. (2000), and Bjornlie and Garrott (2001) also conflict with the results of Meagher's research, suggesting that at present, bison do not use groomed roads for major shifts in distribution (see Final EIS, Chapter IV, Alternative A).

In GTNP the Jackson herd grew from 16 in 1969 to 500 bison by 1999. Because nearly all of the herd winters on the National Elk Refuge (NER) and the rest use areas that are either closed or otherwise restricted to the public, impacts to bison from winter recreation in GTNP are not of great concern. However, an increasing number of bison wintered in the Uhl Hill and Wolff Ridge area in recent years, and they could be affected by continued non- motorized use of this area. Research is ongoing as to the effects of brucellosis on this herd, including the extent to which the disease influences population productivity (Cain et al. 2000).

Elk

Elk once roamed throughout most of North America. By the early 1890s, elk populations were decimated by commercial harvest, competition with livestock, and habitat change (Clark 1999). All remaining large herds were in the GYA. Elk are the most abundant ungulate species in the Yellowstone area with an estimated 50,000 to 60,000 elk in eight to ten separate herds (USFWS 1994). The northern elk herd, the largest in the Yellowstone area, summers in the north, east, and central portions of the park and surrounding mountains, and winters in the northeast, north, and west areas of the park and adjacent lands. The Madison–Firehole, Gallatin–Madison, and

Gallatin Range herds are found west and northwest of Yellowstone. East of Yellowstone are the Clark's Fork, North Fork–Shoshone, and Carter Mountain herds, and south are the Jackson Hole, Targhee, and Sand Creek herds (Clark 1999).

Elevation, topography, weather, vegetation, and escape cover determine elk habitat. Summer range is extensive and reflects vegetative productivity. Winter range is more limited and is determined by lower elevation and snow depth. Thermal areas with snow- free vegetation or shallow snow are also important winter habitats for elk along the Madison, Firehole, and Gibbon Rivers (NPS 1990). A quarter century ago, the Madison–Firehole elk herd in YNP was reported to have adapted to deeper snow by using snow- free thermal areas that provided improved access to forage (Craighead et al. 1973). In describing the herd of 800 to 1,000 elk residing in the Madison–Firehole Valley, Ables and Ables (1987) wrote "…over- winter survival depends heavily on thermal areas that reduce snow accumulations."

Elk generally forage on grasses, followed in preference by browse species and conifers (Clark 1999). Because of natural mortality, elk, like bison, play an important role in the ecological processes of the Yellowstone area. Elk are either preyed upon or their carcasses scavenged by many wildlife species. Carcasses provide an important source of protein for threatened species including grizzly bears, bald eagles, and gray wolves (Swenson et al. 1986; Green et al. 1997; Smith et al. 1998).

The elk in GTNP are considered part of the Jackson elk herd. In addition to the park, the summer range of the Jackson herd includes the Teton Wilderness, the southern part of YNP, and the Gros Ventre Range. Most winter range occurs in the Buffalo Fork Valley, Gros Ventre Range, and NER. Four feedgrounds provide supplemental winter forage, three in the Gros Ventre River drainage and one on the NER. About 80% to 90% of the herd is associated with these feeding areas during the winter (NPS 1995). Many of the elk that summer in the Teton Wilderness and southern YNP migrate through the Parkway and GTNP in the spring and fall. About 200 to 400 remain in the park throughout the winter along the Snake River floodplain and the east side foothills. Few elk winter in the Parkway because of deep snow. To manage the size of the Jackson elk herd, hunting is allowed in specific areas of GTNP east of the Snake River and throughout the entire Parkway. Elk hunting limits the number of Grand Teton elk on the NER during winter and reserves winter range for herd segments that summer outside the park.

Ungulate Energy Budgets

Ungulates function at an energy deficit during winter because snow reduces forage availability, affects an animal's ability to escape predators, and increases energy costs at a time when the nutritional value of forage is low (Beall 1974; Skovlin 1982; Mattfield 1974; Parker et al. 1984). Deep snow greatly increases the amounts of energy expended by deer and elk for locomotion (Parker et al. 1984; Telfer 1978). DelGuidice et al. (1991) found severe energy deprivation of elk in Yellowstone to be associated with increased elk density, deep snow cover, or both. Energy costs, expressed in calories expended per unit of time for various activities, must be balanced by energy intake from foods that provide necessary proteins, fats, and carbohydrates. Energetically expensive reactions by wildlife to winter use, such as fleeing human and/or OSV- related disturbances, can result in higher energy expenditures, which can contribute to malnutrition, which may lead to death directly or increase the risk of death by disease or predation.

Recent Publications

Bjornlie and Garrott (2001). This study examined bison ecology and the use of road corridors in the Madison, Gibbon, and Firehole drainages of Yellowstone National Park during 1998 and 1999. Road grooming facilitates over - snow vehicle use and winter recreation, but has been hypothesized to effect bison movements. Bjornlie and Garrott (2001) made 28,293 observations of bison groups and compared bison travel and migration patterns to the distribution of groomed roads. The study found bison road use was negatively correlated with grooming, with a peak of bison road use in April and lowest use during the period of road grooming operations.

Reinertson et al. (2002). This project monitored bison road use during winters from 1997 to 2002. The authors recorded 13,845 observations of bison locations and travel patterns (approximated by tracks) in relation to groomed road surfaces. Reinertson et al. supported the findings of Aune (1981) and Bjornlie and Garrott (2001) that bison use of groomed roads was minimal. However, Reinertson et al. cautioned that road use by bison was highly variable and that a five- year study provided insufficient data on which to base management decisions.

Davis et al. (2004). This study focused on monitoring the responses of bison, elk, and trumpeter swans to OSVs from December 2002 through April 2003, a relatively mild winter in terms of snow pack and temperatures. Crews conducted 332 surveys of road segments, covering 11,182 kilometers and recorded 4,269 groups of wildlife during these surveys, including 908 groups of elk, 2,294 groups of bison, 447 groups of swans, and 620 groups of other species (e.g., bald eagles, coyotes, wolves). Observers recorded human behaviors and the responses of wildlife to OSVs during 3,020 interactions.

Overall, the authors found that responses of wildlife to OSVs and associated humans were usually minor, with 61% of the observed responses by groups of bison, elk, and swans categorized as no apparent response, 23% look/resume, 5% attention/alarm, 8% travel, 2% flight, and 1% defense. Responses to motorized winter use varied among the different species. The likelihood of observing an active response by bison and swans (but not elk) increased as the numbers of snowmobiles in a group increased. The likelihood of observing an active response by elk and swans (but not bison) increased as the numbers of snowcoaches in a group increased.

The behavior of OSVs and associated humans in response to wildlife groups was usually minor, with 59% of the 1,315 total observed human behaviors to groups of bison, elk, and swans categorized as no visible reaction, 5% stop/resume, 13% stop and observe for an extended period, 13% dismount OSVs, 8% approach wildlife, 1% impede and/or hasten wildlife, and 1% undetermined. Qualitative comparisons suggest that the behaviors of visitors were similar between low and high intensity use areas, and those associated with snowmobiles or snowcoaches.

Bison responded to human activity along roads in 22% of the interactions, less than half as frequently as elk and swans. The vast majority of observed bison groups (159 of 1,668 observations) were using areas off the groomed roads. Elk groups were observed using groomed roads less than bison. Behavioral responses of wildlife decreased as distance from OSV corridors increased. The odds of observing no response by bison, elk, and swans was significantly higher for each 100 meter increase in distance from the road. However, mean distances of bison and elk groups from groomed road segments during winter 2002–2003 did not indicate avoidance of the road as OSV use increased. In combination with the relatively minor and infrequent responses by wildlife to OSV traffic, these results suggest that wildlife habituated to motorized winter use.

Trends in the abundance of bison and elk populations since the onset of OSV use in Yellowstone provides no evidence of population- level effects to ungulates from it, with the abundance of bison and elk either increasing or remaining relatively stable prior to wolf restoration. The authors indicated that any adverse effects to ungulates from OSV use have apparently been compensated for at the population level.

Based on monitoring results during the winter of 2003, the authors recommend that training for guides, park staff, and concessionaires include the followings: 1) stop at distances >100 meters from groups of wildlife when possible; 2) reduce the frequency of multiple groups of motorized vehicles stopping in the same area to observe wildlife; and 3) reduce the number of stops to observe wildlife and human activities away from vehicles during these stops.

White et al. (2004). This study, following the protocols and methodology of Davis et al. (2004), monitored wildlife responses to OSVs from December 2003 through April 2004. Efforts were focused on monitoring the responses of bison, elk, and trumpeter swans to OSVs owing to the proximity and/or perceived sensitivity of these species to OSV recreation during winter. Winter use crews conducted 402 surveys of road segments, covering 11,389 kilometers. Observers recorded 4,940 groups of wildlife during these surveys, including 1,087 groups of elk, 2,597 groups of bison, 686 groups of swans, and 570 groups of other species such as bald eagles, coyotes, and wolves. Observers recorded human behaviors and the responses of wildlife to OSVs during 3,174 interactions.

Snow pack during early winter (i.e., October and November of 2003) was less than the historical average since 1981, but rose to approximately average by late winter, with the exception of the northern range where snow pack remained below average throughout the winter. Compared to previous winters, OSV use by visitors was relatively low, partly because of court orders in December and February and the associated uncertainty about OSV recreation in the park.

Similar to previous winters, the responses of most wildlife species (bison, elk, swans, wolves, coyotes, etc.) to OSVs and associated humans were usually minor, with 58% (n = 1,296) of the 2,239 total observed wildlife responses categorized as no apparent response, 18% (n = 410) look/resume, 11% (n = 252) attention/alarm, 9% (n = 196) travel, 4% (n = 82) flight, and <1% (n = 3) defense. Wildlife responses to OSV use were consistent across species (bison, elk, swans), but the magnitude of the responses varied considerably among species. The likelihood of observing an active response to snowcoaches or increasing numbers of snowmobiles in a group was similar for bison and swans, but significantly higher for elk. The likelihood of a response by each species decreased as distance from the road increased.

The behavior of OSVs and associated humans in response to wildlife groups was relatively minor. Sixty percent of the observed human behaviors toward groups of bison, elk, and swans were categorized as "no visible reaction to wildlife," 24% stopped to observe wildlife while remaining on their snowmobile or inside their coach, 6% left their OSVs, 4% approached wildlife, and 6% impeded and/or hastened wildlife. The percentage of people who had no visible reaction to wildlife was similar during the 2002–2003 and 2003–2004 seasons. The tendency for people to stop their OSVs and observe animals was slightly higher during winter 2003–2004, while the numbers of those leaving their OSV and approaching wildlife decreased.

The authors state that independent studies of the responses of wildlife to OSVs and associated humans in Yellowstone National Park during 1999–2004 (Hardy 2001, Jaffe et al. 2002, Davis et al. 2004) have consistently reported that behavioral responses were relatively infrequent, short

in duration, and of low intensity. Bison and elk were less likely to respond on days with higher traffic, probably because of habituation to the more continuous traffic. Gross calculations of the additional energy costs of travel or flight responses provoked by OSVs were relatively moderate for elk. Thus, wildlife probably does not incur a substantial energetic cost from interactions with OSVs, and these costs are likely compensated for without any significant demographic consequences. These findings are supported by trends in bison and elk abundance, which provide no evidence of population- level effects to ungulates from motorized winter use; abundances have either increased or remained relatively stable prior to wolf restoration. Thus, much like Davis (2004), this report indicates that any adverse effects from OSV use to ungulates have apparently been compensated for at the population level.

Bison were observed on groomed roads during 311 of 2,597 observations. Thus, the vast majority of observed bison groups were using areas off the groomed roads, as has also been noted in previous winters. With regard to bison road use, the authors discuss two ongoing studies: 1) analysis of bison distribution and use of groomed roads during 1997–2004 by Robert Garrott and John Borkowski (Montana State University) and Fred Watson and Susan Alexander (California State University–Monterey Bay); and 2) the development of a conceptual model of bison movement based on remotely sensed landscape features (e.g., vegetation, terrain, and geothermal maps), snow pack measurements and modeling, and bison distribution data (see EA Topics Dismissed).

The authors recommended some substantive changes in wildlife monitoring, given that significant changes in behavioral responses or population- level effects will be difficult to detect in the near future because of the dominating effects of winter severity, predator off- take, and human removals on the behavior and demographics of these populations. They recommended 1) focusing on the behavioral sampling of wildlife responses too OSVs in the Madison–Firehole drainages, while ceasing such monitoring throughout the remainder of the park; 2) using field crews to sample and map bison travel vectors (i.e., trail systems) in the west- central portion of the park (these data can be used to validate the predictions of conceptual models of bison movement like the one mentioned above); and 3) the collection of snow- urine samples from northern and central Yellowstone ungulates to assess nutrition, which will provide information on the energetic costs and physiological consequences of various environmental conditions, interactions with OSVs, and road grooming.

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CHAPTER IV: ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

This chapter contains the scientific and analytical foundation for comparing the alternatives. The alternatives are intended to define the issues sharply and provide a clear choice. Much of this analysis incorporates sections from the Final EIS and Final SEIS by reference, and it is limited to the fundamental question of the impacts of motorized oversnow use—specifically, snowmobiles and snowcoaches. Chapter III presented the affected environment, which is limited to areas that may be affected by differences in the EA alternatives. Some impact topics addressed in the Final EIS and Final SEIS require no additional analysis, and these were dismissed near the beginning of Chapter III. The material in the Final EIS and Final SEIS environmental consequences sections remains valid.

In some cases, modeling has been done to compare the alternatives. While these models are theoretical in nature and may not precisely predict actual conditions, they are helpful to inform decision makers about the possible environmental effects of the alternatives and allow comparisons to be made. Monitoring data is also used where available to assess the potential impacts of the alternatives.

For each impact topic, this analysis focuses on the impacts of each alternative in the first winter season when it would be fully implemented. Alternatives 3 and 5 have features that would be phased in after the first winter. Specifically, alternative 3 allows 95 unguided entries in YNP each day beginning with the second winter of implementation (2005–2006). Alternative 5 allows 190 entries per day to be unguided in the first winter of implementation, with requirements for non-commercial guides beginning with the second winter. In addition, alternative 5 does not have BAT requirements for these 190 snowmobiles in the first year of implementation. Thus, impacts for alternative 5 could be somewhat greater during the first winter than projected in this analysis.

In most cases, the impacts of the alternatives are compared with alternative 1 and the historic conditions. These scenarios represent two of the no action possibilities. In addition, the alternatives are often compared with each other. Impacts are not specifically compared against alternative 4, the third possible no action alternative. While not explicit, these comparisons are generally evident in the conclusions of each impact topic.

THE EFFECTS OF IMPLEMENTING THE ALTERNATIVES ON AIR QUALITY AND AIR QUALITY- RELATED VALUES

Modeling was done to compare the impact on air quality and air quality- related values among the alternatives. Modeling assumptions, methods, and other details are discussed in this section. Modeling was focused on areas where the impacts of OSV recreation were likely to be most evident. A technical report by the NPS contractor, Air Resources, Inc., which describes additional detail about modeling methods, assumptions, and results, is available upon request.

The discussion of impacts of vehicle emission exposure focuses on the exposure of employees and visitors to the "worst case" air pollutant levels of CO and PM_{10} predicted by air dispersion

modeling. The intensity of an impact is categorized as negligible, minor, moderate, or major compared to historical conditions. The definition of each impact category is summarized in Table 27.

Table 27. Definition and intensity of impacts to air quality and air quality- related values.

Impact Category	Definition
Negligible	The impact on air quality is not measurable or perceptible. There is no noticeable change in visibility at any time or place.
Minor	The impact on air quality is measurable, but localized within a relatively small area. It may not be perceptible. There may be noticeable but infrequent and short duration changes in visibility near staging areas.
Moderate	The impact on air quality is measurable and perceptible, but could be reversed. Impacts remain localized. There may be noticeable, frequent and regular changes in visibility near staging areas and heavily traveled routes.
Major	The impact is substantial and highly noticeable. There may be noticeable, frequent, long duration and regular changes in visibility near staging areas and heavily traveled routes. Class I air sheds, or areas within them, are degraded.

METHODS AND ASSUMPTIONS

Snowmobile and Snowcoach Emissions Information

This analysis considers only emissions associated with snowmobiles and snowcoaches, not other vehicles, because the EA alternatives under consideration do not affect other modes of transportation. For the historical conditions, the air quality analysis assumes that all snowmobiles had two- stroke engines. For each alternative, the analysis assumes that all snowmobiles have four- stroke engines that meet the proposed BAT requirements. Although alternative 5 would allow a mix of 80% two- stroke BAT snowmobiles and 20% standard four-stroke snowmobiles during the first year (2004- 2005), the data presented here are for the second year (2005- 2006), when all snowmobiles will have to meet BAT requirements.

Table 28 summarizes the snowmobile and snowcoach emissions information used for the air quality assessment in the this EA. Data is shown for three modes of snowmobile operation, the fastest of which approximates conditions at 35–45 mph. Previously, snowmobiles have operated in Yellowstone National Park at higher speeds, albeit illegally. However, with the use of guides and enforcement of speed limits in the park, the assumption of a maximum speed in this range is reasonable. Snowcoaches generally operate at slower speeds than snowmobiles, so the table shows only the data for snowcoaches idling and traveling at 15 mph.

Table 28. Snowmobile and snowcoach air emissions summary.

	PM- 2.5			CO			HC			NO_x		
	Idle (g/hr)	15- 20 mph (g/mi)	35- 45 mph (g/mi)	Idle (g/hr)	15- 20 mph (g/mi)	35- 45 mph (g/mi)	Idle (gm/hr)	15- 20 mph (g/mi)	35- 45 mph (g/mi)	Idle (g/hr)	15- 20 mph (g/mi)	35- 45 mph (g/mi)
2- stroke snowmobiles	3.77	4.09	1.31	266.0	220.56	242.88	473.0	179.85	78.67	0.53	0.21	0.29
4- stroke snowmobiles	0.49	0.80	1.07	191.47	35.11	22.89	35.28	2.82	2.32	0.80	2.87	8.12
Snowcoaches	Not Avail- able	0.279		7.47	66.720		30.7	1.106		487	1.394	

Snowmobile Emissions. All snowmobile engine data are based on the average emissions from snowmobiles tested by the equipment manufacturer or by the Southwest Research Institute (SWRI). Average two- stroke engine emission factors were based on tests performed by SWRI using four different engines. Emission testing and engine performance were measured following standard EPA procedures. Emission factors in grams per mile for traveling snowmobiles and in grams per hour for idling snowmobiles were calculated from engine horsepower output using information in the SWRI report. Similar emission testing and engine performance data were obtained from the manufacturers for BAT- approved four- stroke snowmobiles (Arctic Cat T660, Polaris Frontier, and Ski- Doo Legend with Yellowstone BAT kit). The four- stroke data shown in Table 28 are the average for these snowmobiles. For a comparison of the emissions data for different four- stroke snowmobiles, see Table 13 in Chapter III.

Snowcoach Emissions. Snowcoach emissions data have generally relied on data from light-duty gasoline trucks. However, operating characteristics of truck engines in normal highway use are likely to be different from engines functioning while powering snowcoaches. To date, only one snowcoach has gone thorough emissions testing. The results of that test, performed by SWRI, were used in these analyses and are shown in Table 28. The SWRI test represents the best available emissions data for snowcoaches, but the data is less directly applicable than for snowmobiles due to the uncertainty about how often snowcoaches operate in open- loop mode (this issue is detailed in this analysis under "Uncertainties."

Modeling Locations

West Entrance. Snowmobiles and snowcoaches stop for a short time at the West Entrance while permits are checked. Emissions are based on an average approach and departure speed of 15–20 mph and an average engine idle time of 30 seconds. The approach and exit length from the West Entrance is 1,000 feet in either direction from the entrance (2,000 feet total). Snowmobile numbers for the calculations are based on the proposed daily limits in the EA, plus 7% to account for people who may exit and reenter the park in a single day.

Roadway Segments. For each roadway segment, the emissions are calculated using the 35–45 mph emissions data for snowmobiles and the 15 mph emissions data for snowcoaches plus the segment length and the vehicle access numbers shown in Appendix A, "Motorized Oversnow Vehicle Access Scenarios." For travel segments within the park, the snowmobile numbers are a percentage of total park- wide daily entrance limits based on estimated traffic patterns and visitor use. For segments that end at an entrance station, the snowmobile numbers are based on the entrance limits plus a factor to account for park exit and reentry. These factors, which vary by entrance, are also documented in Appendix A.

Old Faithful Staging Area. The Old Faithful area receives heavy visitor use, even during winter when access is by snowmobile and snowcoach. Air emissions at the staging area were calculated only for engine idling, which is assumed to average five minutes for each vehicle. Engine emission calculations did not explicitly include ingress and egress traffic as this is included in the roadway segment emissions. For vehicle numbers, the sum of the two travel segments to Old Faithful (Madison to Old Faithful and Old Faithful to West Thumb) was used, which assumes that all vehicles on these segments enter the Old Faithful staging area.

MODELING RESULTS

Table 29 summarizes the total snowmobile and snowcoach emissions for each alternative for Yellowstone National Park. Data are presented for four primary pollutants: carbon monoxide (CO), hydrocarbons (HC), nitrogen oxides (NOx), and particulate matter ($PM_{-2.5}$).

Table 29. Air emissions in Yellowstone, comparison of alternatives.

	Carbon Monoxide		Hydrocarbons		Nitrogen Oxides		Particulate (<2.5 m)	
	(lb/day)	(ton/season)	(lb/day)	(ton/season)	(lb/day)	(ton/season)	(lb/day)	(ton/season)
Historical conditions	41,430	1,864	13,514	608	52	2	226	10
Alternative 1	1,686	76	28	1	48	2	8	> 1
Alternative 2	2,740	123	192	9	645	29	86	4
Alternative 3	3,537	159	309	14	1,132	51	138	6
Alternative 4	4,090	184	386	17	1,306	59	177	8
Alternative 5	5,229	235	517	23	2,771	125	233	10

The comparison shows that all of the alternatives would produce significant reductions in emissions of CO and HC compared to historical conditions. $PM_{2.5}$ emission reductions are not as dramatic. For NOx, the alternatives tend to result in increased emissions. However, NOx and CO emissions tend to have an inverse relationship in most fuel combustion engines, and significant reductions in CO and HC emissions are often accompanied by an increase in NOx. In addition, the air quality issues associated with snowmobiles are primarily related to the health effects of CO exposures rather than NOx exposure. As such, the air quality benefits of the CO and HC reductions outweigh the increase in NOx emissions that may result from the various alternatives.

Hazardous Air Pollutant (HAP) Emissions

Emissions of hazardous air pollutants (HAPs) occur in snowmobile emissions and are associated with incomplete fuel combustion. These emissions were estimated as a fraction of the estimated HC emission based on data in "Regulatory Analysis—Control of Air Pollution Emission Standards for Non- Road Spark- Ignition Marine Engines" (EPA 1996). In the absence of specific HAP data for snowmobile emissions, the data from marine engines are viewed as representative. Four HAPs have been identified in these emissions: benzene, 1- 3 butadiene, formaldehyde, and acetaldehyde. The percentage of each compound in the total volatile organic compounds mass is: benzene,1.2%; 1- 3 butadiene, 0.16%; formaldehyde, 0.36%, and acetaldehyde, 0.08%. Table 30 summarizes the HAP emissions for each alternative.

Table 30. HAP emissions in Yellowstone, comparison of alternatives.

	Benzene		1- 3 Butadine		Formaldehyde		Acetaldehyde	
	(lb/day)	(ton/yr)	(lb/day)	(ton/yr)	(lb/day)	(ton/yr)	(lb/day)	(ton/yr)
Historical Conditions	162	7.30	21.6	0.973	48.7	2.189	10.8	0.486
Alternative 1	0.3	0.02	0.04	0.002	0.10	0.004	0.02	0.001
Alternative 2	2.3	0.10	0.30	0.014	0.69	0.031	0.15	0.007
Alternative 3	3.7	0.17	0.49	0.022	1.11	0.050	0.25	0.011
Alternative 4	4.6	0.21	0.62	0.028	1.39	0.625	0.31	0.014
Alternative 5	6.2	0.28	0.83	0.037	1.86	0.084	0.41	0.019

The emissions data in Table 28 have been used in the air quality dispersion models to predict the impact of snowmobile and snowcoach emissions. Air quality modeling has been performed at locations in the park that are expected to generate the worst- case ambient air quality impacts associated with snowmobile operations: West Entrance, the West Entrance to Madison road segment, and Old Faithful staging area.

West Entrance Air Quality Modeling

The air quality modeling of emissions at the West Entrance was performed using the CAL3QHC air quality model (USEPA 1995), which is designed to predict air quality concentrations in the vicinity of roadway intersections. Because the West Entrance has snowmobiles and snowcoaches stopping and idling for short periods, the traffic flow through this location has the characteristics of a signalized intersection, with vehicles queuing and idling.

CAL3QHC was run for the Yellowstone West Entrance analysis using worst- case meteorological conditions (F stability and 1.0 m/sec wind speed). Wind directions were every five degrees across the entire arc (0 – 360 degrees). The results returned by CAL3QHC were the worst- case 1- hour average CO concentration. Modeled emissions were based on estimated traffic at the West Entrance for the worst- case hour under each alternative, as listed below:

Alternative	Number of Snowmobiles	Number of Snowcoaches
Historical Conditions	340	5
Alternative 1	0	52
Alternative 2	101	38
Alternative 3	183	26
Alternative 4	253	16
Alternative 5	348	5

The NAAQS for CO is 35 parts per million (ppm) 1- hour average and 9 ppm 8- hour average. The CAL3QHC result can be compared directly to the 1- hour average NAAQS. For the 8- hour average, the worst- case 1- hour average was converted to an 8- hour average using a persistence factor of 0.4. This factor was determined based on the 8- hour to 1- hour ratio of actual CO measurements collected at the West Entrance monitoring station from October 1998 through December 2001. (Coefield, May 2002). The CO modeling results shown in Table 31 indicate significant improvement in air quality in all the alternatives compared to the historical conditions of essentially unregulated snowmobile use.

Table 31. West Entrance, maximum carbon monoxide concentrations.

West Entrance	1- hour Carbon Monoxide			8- hour Carbon Monoxide		
	CAL3QHC Results (ppm)	Background (ppm)	Total (ppm)	CAL3QHC Results (ppm)	Background (ppm)	Total (ppm)
Historical Conditions	15.6	3.0	18.6	6.2	1.2	7.4
Alternative 1	0.4	3.0	3.4	0.2	1.2	1.4
Alternative 2	2.8	3.0	5.8	1.1	1.2	2.3
Alternative 3	5.6	3.0	8.6	2.2	1.2	2.4
Alternative 4	7.1	3.0	10.1	2.8	1.2	4.0
Alternative 5	8.1	3.0	11.1	3.2	1.2	4.2

8- hour background = 1- hour background x 0.4 (persistence factor)
1- hour average CO standard = 35 ppm
8- hour average CO standard = 9 ppm

West Entrance to Madison Road Segment Air Quality Modeling. This road segment was selected for air modeling because it carries the most traffic and is expected to produce peak emissions and associated impacts from snowmobile and snowcoach traffic. The CAL3QHC model was also used for modeling this road segment, except that the queuing time was set to zero because it has no intersection or other normal obstacle to traffic. A traffic segment of 3.25 miles was modeled as representative of all similar segments. The peak hourly traffic rate and worst- case meteorology was used as described for the West Entrance model. The predicted worst- case 1- hour average CO concentration was adjusted to an 8- hour average concentration using the 0.4 persistence factor determined previously. The CO modeling results shown in Table 32 indicate significant improvement in air quality in all the alternatives compared to the historical conditions.

Table 32. West Entrance to Madison Roadway, maximum carbon monoxide concentrations.

West Entrance to Madison Roadway	1- hour Carbon Monoxide			8- hour Carbon Monoxide		
	CAL3QHC Results (ppm)	Background (ppm)	Total (ppm)	CAL3QHC Results (ppm)	Background (ppm)	Total (ppm)
Historical Conditions	11.8	0.65	12.45	4.7	0.26	4.96
Alternative 1	0.1	0.65	0.75	0.0	0.26	0.26
Alternative 2	0.4	0.65	1.05	0.2	0.26	0.46
Alternative 3	0.7	0.65	1.35	0.3	0.26	0.56
Alternative 4	1.0	0.65	1.65	0.4	0.26	0.66
Alternative 5	1.4	0.65	2.05	0.6	0.26	0.86

8- hour background = 1- hour background x 0.4 (persistence factor)
1- hour average CO standard = 35 ppm
8- hour average CO standard = 9 ppm

Old Faithful Staging Area Air Quality Modeling

The Old Faithful staging area was selected for modeling because of the concentration of emissions from snowmobiles and snowcoaches there, primarily due to the idling of engines as visitors enter and leave the area. It is different from roadway traffic segments in that the emissions are clustered in an area, so a line source model such as CAL3QHC is not appropriate. Instead, the EPA Industrial Source Complex (ISCST3) model was selected, utilizing its area source dispersion capabilities. The Old Faithful staging area emissions were assigned to an area source with dimensions of 630 meters by 1037 meters (2077 by 3402 feet), the approximate size of the snowmobile parking area at Old Faithful. The modeling is based on estimated peak hourly traffic for each alternative, listed below.

Alternative	Number of Snowmobiles	Number of Snowcoaches
Historical Conditions	408	9
Alternative 1	0	67
Alternative 2	165	44
Alternative 3	279	28
Alternative 4	372	15
Alternative 5	491	8

Because ISCST3 requires actual meteorological data, a two- month winter data set from the West Entrance monitoring site was used for input. Even though sequential meteorological data were used, the results were treated in a worst- case manner because of the limited meteorological data set. The ISCST3 results were evaluated to determine the worst- case 1- hour average impact (regardless of the time period this impact occurred) and the 8- hour CO concentration was determined using the persistence factor of 0.4. This approach assumes that the worst- case meteorology may occur concurrently with peak emissions. The CO modeling results shown in Table 33 indicate significant improvement in air quality in all the alternatives compared to the historical conditions.

Table 33. Old Faithful staging area, maximum carbon monoxide concentrations.

Old Faithful Staging Area	1- hour Carbon Monoxide			8- hour Carbon Monoxide		
	ISCST3 Results (ppm)	Background (ppm)	Total (ppm)	ISCST3 Results (ppm)	Background (ppm)	Total (ppm)
Historical Conditions	22.1	0.65	22.75	8.8	0.26	9.06
Alternative 1	0.1	0.65	0.75	0.0	0.26	0.26
Alternative 2	6.5	0.65	7.15	2.6	0.26	2.86
Alternative 3	10.9	0.65	11.55	4.4	0.26	4.66
Alternative 4	14.5	0.65	15.15	5.8	0.26	6.06
Alternative 5	20.6	0.65	21.25	8.2	0.26	8.46

8- hour background = 1- hour background x 0.4 (persistence factor)
1- hour average CO standard = 35 ppm
8- hour average CO standard = 9 ppm

UNCERTAINTIES

The results of the Yellowstone air quality analysis presented above are based on the best available information concerning emissions and other factors affecting air quality. However, in some cases, the available data on emissions are relatively limited and there are uncertainties in the data. These major uncertainties are discussed below.

Snowcoach Emissions Factors

Historical data on snowcoach emissions have been based on wheeled vehicles. As such, it is likely that using such data may underestimate actual emissions for a snowcoach when equipped with tracks. To date, there has only been one emissions test of an engine operating under conditions to simulate snowcoach performance, and it was only an engine test, not a chassis dynamometer test of a snowcoach. However, even with these known limitations and their associated uncertainties, it is more appropriate to use the emissions data from this test of simulated snowcoach operations than it is to extrapolate data from tests of a different vehicle type. Future air quality analyses would benefit greatly from further testing of snowcoach emissions, thus reducing the uncertainty of the data. In addition, the fraction of time that a snowcoach operates in closed loop (with emission controls) or open loop (bypassing emission controls) is unknown. The assumption was made that snowcoaches operate one- third of the time in closed loop and two- thirds of the time in open loop. Testing of snowcoaches in actual operation could provide specific data to reduce this uncertainty.

Condensable PM Emissions

The testing methods used to determine particulate emissions from vehicles such as snowmobiles collect PM on a filter, but do not measure PM that might occur from condensable organic material in the exhaust. These emissions occur in vapor phase at the exhaust outlet of the engine due to the high exhaust temperature, which means that they pass through the filter media, but they could condense into liquid or solid PM mass as the emissions cool. All condensable PM emissions likely fall into the $PM_{2.5}$ size. The degree to which the $PM_{2.5}$ emissions could be understated by this effect is probably a function of the HC emissions. As such, this error probably underestimates $PM_{2.5}$ from two- stroke snowmobile engines more than from four-stroke engines.

Worst- case Assumptions

The methods applied in the air dispersion modeling analysis are intended to result in estimates of worst- case short- term CO exposures (1- hour averages). The analysis does not assess the probability that such concentrations may actually occur or their potential frequency of occurrence. For example, the modeling assumes that the worst- case meteorological dispersion conditions (typically a stable atmosphere with low wind speeds) will occur simultaneously with the peak traffic hour for snowmobiles and snowcoaches. This method provides a reasonable estimate of the upper bound on the CO concentrations associated with each alternative and provides a sound basis for comparisons of the alternatives. However, the modeled CO concentrations may not occur in reality and the probability is that concentrations at these levels, if they occur, would be relatively infrequent. Nonetheless, the modeled worst- case figures produced by this analysis for historical conditions are slightly less than actual monitored worst-case conditions. For example, compare the historical CO 1- hour and 8- hour modeled results at

the West Entrance with the monitored maximum concentrations in Chapter III in the section on Air Quality.

CONCLUSION

The results of the air quality modeling revealed that none of the alternatives would be likely to exceed the CO and PM2.5 NAAQS, or the Montana or Wyoming ambient air quality standards. Compared to the historical conditions, all of the alternatives were projected to improve carbon monoxide and hydrocarbon concentrations because of the BAT requirements and the daily entry limits for snowmobiles. The largest improvements are seen under alternative 1, because it would most greatly reduce the number of OSVs. Alternative 1 would result in nearly 10 times fewer $PM_{2.5}$ emissions than alternative 2 and 25 times fewer than alternative 5. Because it would allow visitation to increase beyond historical averages, alternative 5 yields approximately the same amount of $PM_{2.5}$ emissions as historical conditions.

Nitrogen oxides are expected to increase all of the alternatives, with the largest increases occurring in alternative 5 because it would allow the largest number of snowmobiles. Nitrogen oxides tend to have an inverse relationship with CO emissions. However, the air quality impacts associated with winter use are primarily related to CO emissions rather than NOx exposure.

All of the alternatives significantly reduce hazardous air pollutant emissions, including benzene, 1- 3 butadiene, formaldehyde, and acetaldehyde. These were calculated as a direct function of total HC emissions, so they followed the same pattern as HC emissions for each alternative.

Preliminary adaptive management thresholds were set for air quality in the SEIS in order to provide an indicator to park managers about when management actions might be taken to adjust daily entry limits, alter technology requirements, etc. The adaptive management thresholds for air quality are identified in Table 34.

Table 34. Final SEIS adaptive management thresholds for developed areas and groomed roadways.

	1- Hour CO (w/background)	8- Hour CO (w/background)	24- Hour PM_{10} (w/background)
Developed Areas	8 ppm	3 ppm	23 ug/m^3
Groomed Roadways	1 ppm	1 ppm	6 ug/m^3

The air quality modeling indicates that alternatives 1 and 2 would not exceed any adaptive management thresholds at any location that was selected for modeling.

At the West Entrance, alternative 3 is projected to slightly exceed the 1- hour CO threshold, while alternatives 4 and 5 would exceed it by 26% and 39%, respectively. Alternatives 4 and 5 would also exceed the 8- hour adaptive management threshold at the West Entrance. At Old Faithful, alternatives 3, 4 and 5 would exceed both the 1- hour and 8- hour CO adaptive management thresholds. Along roadway segments, no alternatives would exceed the 8- hour CO adaptive management thresholds. Alternatives 4 and 5 are projected to exceed the 1- hour threshold of 1 ppm.

Visibility modeling was not conducted for this EA, so it is unknown whether or to what degree the alternatives may impact visibility.

Compared to historical conditions, alternative 1 would have major beneficial impacts on air quality. Compared to a hypothetical baseline condition in which there were no air quality impacts, alternative 1 would have negligible adverse effects on most of the park, and minor adverse impacts along travel corridors and at staging areas. Impacts associated with alternative 1 are not of sufficient magnitude to constitute impairment of park resources and values.

Compared to historical conditions, alternative 2 would have major beneficial impacts on air quality. Compared to alternative 1, alternative 2 would have negligible adverse effects on most of the park, and minor adverse impacts along travel corridors and at staging areas. Impacts associated with alternative 2 are not of sufficient magnitude to constitute impairment of park resources and values.

Compared to historical conditions, alternative 3 would have major beneficial impacts on air quality. Compared to alternative 1, alternative 3 would have negligible adverse effects on most of the park, minor adverse impacts along travel corridors, and moderate adverse impacts at staging areas. Impacts associated with alternative 3 are not of sufficient magnitude to constitute impairment of park resources and values.

Compared to historical conditions, alternative 4 would have moderate beneficial impacts on air quality. Compared to alternative 1, alternative 4 would have negligible adverse effects on most of the park, and moderate adverse impacts along travel corridors and at staging areas. Impacts associated with alternative 4 are not of sufficient magnitude to constitute impairment of park resources and values.

Compared to historical conditions, alternative 5 would have moderate beneficial impacts on air quality. Compared to alternative 1, alternative 5 would have negligible adverse effects on most of the park, moderate adverse impacts along travel corridors, and moderate to major adverse impacts at staging areas. Impacts associated with alternative 5 are not of sufficient magnitude to constitute impairment of park resources and values.

THE EFFECTS OF IMPLEMENTING THE ALTERNATIVES ON EMPLOYEE AND PUBLIC HEALTH AND SAFETY

METHODS

To assess the level of impact to employee and public health and safety under each alternative, the following types of information were used:

- Report from IHI Environmental (March 12, 2004) concerning the exposure of NPS employees during the 2003- 2004 season.
- Reports from employees and commercial guides.

- Reports submitted to NPS from Occupational Safety and Health Administration (OSHA) and National Institute for Occupational Safety and Health (NIOSH) documenting the hazards to employees from working with the current mix of winter transportation in YNP.
- Results of air monitoring near the West Entrance in YNP.
- A review of infractions associated with unsafe snowmobiling behaviors.
- Anecdotal reports by employees related to observed unsafe snowmobiling behaviors.

Additional information on impacts to employee and public health and safety is included in the Final SEIS (pages 187–195). Table 35 defines impacts to health and safety based on magnitude.

Table 35. Definition of impacts to health and safety.

Impact Category	Definition
Negligible	The impact to employee or public health and safety is not noticeable or perceptible.
Minor	The impact to employee or public health and safety is measurable or perceptible. Impacts to safety may be realized through a minor increase or decrease in the potential for visitor conflicts in current accident locations. Impacts to employee and visitor health are interpreted as of low risk if Agency for Toxic Substances and Disease Registry (ATSDR) Minimal Risk Levels (MRLs) are never exceeded, and are approached infrequently in no more than a few local areas
Moderate	The impact to employee or public health and safety is sufficient to cause a permanent change in accident rates at existing low accident locations or create the potential for additional visitor conflicts in areas that currently do not exhibit noticeable visitor conflicts. Impacts to employee and visitor health are interpreted as of moderate risk if ATSDR MRLs are regularly approached, and may be exceeded occasionally at peak use times where employees live or work.
Major	The impact to employee or visitor safety is substantial either through the elimination of potential hazards or the creation of new areas with a high potential for serious accidents or hazards. Impacts to employee and visitor health are interpreted as a major risk if ATSDR MRLs are regularly exceeded in public areas or where employees live or work.

ALTERNATIVE 1

Because this alternative would use only snowcoaches to provide visitor transportation on groomed roads, total air emissions would be significantly lower than in the other alternatives. Exposure to toxic air pollutants and sound at the West Entrance and locations throughout the parks would be significantly reduced. The presence of fewer oversnow vehicles would also make it easier to maintain a smooth road surface and reduce the number of ranger patrols needed. This would minimize injuries caused by the jarring of a bumpy road surface and reduce exposure to the unsafe operation of snowmobiles.

Avalanche control using helicopters rather than a ground- based howitzer should improve safety to employees involved in the avalanche control operation by eliminating the need to cross active avalanche zones to reach the howitzer, reducing the number of dud rounds and the need for post- control releases because of much greater accuracy, and making it easier to locate the duds. Security issues will be minimized. Helicopter operations do involve safety concerns unto themselves, especially in the winter. Prior to the initiation of the pilot program for helicopter-based avalanche control, a hazard analysis will be completed for the use of the helicopter- based explosives and standard operating procedures will be developed.

Conclusion

The effects of implementing this alternative would be beneficial, moderate, and long term due to the elimination of visitor snowmobile accidents in the parks. Avalanche control operations would continue to pose adverse, moderate threats to employee safety near the East Entrance of YNP. There would not be high levels of carbon monoxide, benzene, or toluene, therefore effects related to high levels of these or other NAAQS pollutants would be negligible. Employees who are susceptible to respiratory problems would not likely be affected by this alternative. Compared to historical conditions, there would be a major, beneficial, long- term impact in reducing pollutants (also see Effects of Implementing the Alternatives on Air Quality).

ALTERNATIVE 2

Snowmobiling would continue in this alternative, but at significantly lower levels than in historical conditions. Peak days would not occur because of daily entry limits. All snowmobiles would have to meet BAT requirements, making them the cleanest and quietest snowmobiles commercially available. Visitor and employee exposure to exhaust would continue, but at significantly lower levels than in historical conditions.

In addition, all snowmobiles in YNP would be led by commercial guides, which would contribute significantly to a safer park environment for employees and visitors and reduce the need for NPS law enforcement and entrance station rangers to monitor BAT compliance. Commercial guides would ensure that snowmobiles in their groups do not speed, travel in single file, and do not pass other groups except when it is safe to do so. They would also have a vested interest in insuring that their clients' snowmobiles meet BAT requirements and are not modified in such a way that air or sound emissions might be increased. Guides would not be required on the CDST or Grassy Lake Road.

Avalanche control would continue, with similar impacts to those described for alternative 1.

The quality of groomed roads would improve significantly due to the reduced number of vehicles compared to historical conditions.

Conclusion

This alternative would result in direct, moderate, beneficial, and long- term impacts compared to historical conditions because of reduced snowmobile use and the requirements for using BAT and commercial guides. Compared to alternative 1, this alternative would result in minor adverse impacts to health and safety because of the additional snowmobile traffic.

Because of BAT requirements, and the significantly reduced numbers of snowmobiles, park employees working at staging areas would be unlikely to suffer from headaches, nausea, or other ailments associated with snowmobile emissions. Exposure to toxic air pollutants, such as benzene and toluene, would remain a concern, and NPS would continue to conduct personal exposure monitoring studies on employees. During periods of poor weather conditions, such as an inversion, ATSDR MRLs may be approached or occasionally exceeded in staging areas.

Effects to employee hearing would be adverse and moderate due to quieter machines. Employees and visitors may choose to wear hearing protection to mitigate these impacts.

ALTERNATIVE 3

Snowmobiling would continue in this alternative, but at lower levels compared to historical conditions. Peak days would not occur because of daily entry limits on snowmobiles. All snowmobiles would have to meet BAT requirements, making them the cleanest and quietest snowmobiles commercially available. Visitor and employee exposure to exhaust would continue, but at significantly reduced levels compared to historical conditions.

In addition, approximately 82% of snowmobiles in YNP would be led by commercial guides, which would contribute significantly to a safer park environment for employees and visitors and reduce the need for NPS law enforcement and entrance station rangers to monitor BAT compliance. Commercial guides would ensure that snowmobiles in their groups do not speed, travel in single file, and do not pass other groups except when it is safe to do so. They would also have a vested interest in insuring that their clients' snowmobiles meet BAT requirements and are not modified in such a way that air or sound emissions might be increased. However, approximately 18% of YNP visitors would be allowed to travel unguided. There would be less assurance that these visitors would travel safely through the park by heeding speed limits, passing safely, etc. Guides would not be required on the CDST or Grassy Lake Road.

Avalanche control would continue, with similar impacts to those described for alternative 1.

The quality of groomed roads would improve significantly due to the reduced number of vehicles compared to historical conditions. However, on warm days with poor snow cover, there could be adverse effects on the quality of the groomed road surface, which could result in injuries caused by the jarring of bumpy road conditions.

Conclusion

This alternative would result in direct, long- term, and moderate beneficial impacts compared to historical conditions, due to reduced snowmobile use and the requirements for using BAT and commercial guides. Compared to alternative 1, this alternative would result in moderate adverse impacts to health and safety because of the additional traffic created by snowmobile use and the presence of unguided snowmobilers.

Because of BAT requirements, and the reduced numbers of snowmobiles, park employees working at staging areas would be unlikely to suffer from headaches, nausea, or other ailments associated with snowmobile emissions. Exposure to toxic air pollutants, such as benzene and toluene, would remain a concern, and NPS would continue to conduct personal exposure

monitoring studies on employees. During periods of poor weather conditions, such as an inversion, ATSDR MRLs may be approached or exceeded in staging areas.

Effects to employee hearing would be adverse and moderate due to quieter machines. Employees and visitors may choose to wear hearing protection to mitigate these impacts.

ALTERNATIVE 4

Snowmobiling would continue in this alternative, but at levels similar to those of historical conditions. Peak days would not occur because of daily entry limits on snowmobiles. All snowmobiles would have to meet BAT requirements, making them the cleanest and quietest snowmobiles commercially available. Visitor and employee exposure to exhaust would continue, but at reduced levels compared to historical conditions.

In addition, all snowmobiles in YNP would be led by commercial guides, which would contribute significantly to a safer park environment for employees and visitors and reduce the need for NPS law enforcement and entrance station rangers to monitor BAT compliance. Commercial guides would ensure that snowmobiles in their groups do not speed, travel in single file, and do not pass other groups except when it is safe to do so. They would also have a vested interest in insuring that their clients' snowmobiles meet BAT requirements and are not modified in such a way that air or sound emissions might be increased. Guides would not be required on the CDST or Grassy Lake Road.

Avalanche control would continue, with similar impacts to those described for alternative 1.

Alternative 4 would have minor beneficial effects on the quality of groomed roads compared to historical conditions. On warm days with poor snow cover, there could be adverse effects on the groomed road which could result in injuries caused by the bumpy surface.

Conclusion

Because of reduced snowmobile use and the requirements for using BAT and commercial guides, this alternative would result in direct, long- term, and moderate beneficial impacts compared to historical conditions. Compared to alternative 1, this alternative would result in moderate adverse impacts to health and safety because of the additional traffic created by snowmobile use. Because of BAT requirements and daily snowmobile entry limits, park employees working at staging areas would be unlikely to suffer from headaches, nausea, or other ailments associated with snowmobile emissions. Exposure to toxic air pollutants, such as benzene and toluene, would remain a concern, and the NPS would continue to monitor exposure by employees. During poor weather conditions, such as an inversion, ATSDR MRLs may be approached or exceeded in staging areas.

Effects to employee hearing would be adverse and moderate due to quieter machines. Employees and visitors may choose to wear hearing protection to mitigate these impacts.

ALTERNATIVE 5

Snowmobiling would continue in this alternative, but at higher levels than in historical conditions. However, historical peak days, when as many as 1,500 snowmobiles entered YNP,

would not occur because of daily entry limits on snowmobiles. All snowmobiles would have to meet BAT requirements, making them the cleanest and quietest snowmobiles commercially available. Visitor and employee exposure to exhaust would continue, but at reduced levels compared to historical conditions.

In addition, 80% of snowmobiles in YNP would be led by commercial guides, which would contribute significantly to a safer park environment for employees and visitors and reduce the need for NPS law enforcement and entrance station rangers to monitor BAT compliance. Commercial guides would ensure that snowmobiles in their groups do not speed, travel in single file, and do not pass other groups except when it is safe to do so. They would also have a vested interest in insuring that their clients' snowmobiles meet BAT requirements and are not modified in such a way that air or sound emissions might be increased. However, approximately 20% of YNP visitors would be allowed to travel unguided. There would be less assurance that these visitors would travel safely through the park by heeding speed limits, passing safely, etc. However, approximately 20% of YNP visitors would be allowed to travel in self- guided groups in which one member has received training in how to appropriately and safely travel through the park. There would be less assurance that these visitors would travel safely through the park by heeding speed limits, passing safely, etc., as compared with commercially guided groups. Guides would not be required on the CDST or Grassy Lake Road.

Avalanche control would continue, with similar impacts to those described for alternative 1.

Under alternative 5, the quality of groomed roads could be adversely affected because the daily snowmobile limit would be nearly 25% higher than the historical average of 765 snowmobiles per day. Poor road conditions would be exacerbated on warm days with poor snow cover, when there would be adverse effects on the quality of the groomed road surface, which could result in injuries caused by the jarring of bumpy road conditions.

Conclusion

Because of reduced snowmobile use and the requirements for using BAT and commercial guides, this alternative would result in direct, long- term, and minor to moderate beneficial impacts compared to historical conditions. Compared to alternative 1, this alternative would result in moderate adverse impacts to health and safety because of the additional traffic created by snowmobile use and the presence of some snowmobiles without professional guides.

Where high levels of NAAQS pollutants occur, employees who are susceptible to respiratory problems could be adversely affected. In addition, exposure to other toxic air pollutants, such as benzene and toluene, would remain a concern. and the NPS would continue to monitor exposure by employees. ATSDR MRLs could be approached and occasionally exceeded at staging areas, especially during periods of poor weather conditions, such as an inversion. However, BAT requirements and daily entry limits would mitigate this to some degree. Overall impacts would be minor on less heavily used road segments and minor to moderate on heavily used road segments and in staging areas. The highest levels would occur at times and places where large numbers of oversnow vehicles stage for entry into the parks (see above in this chapter, "Effects of Implementing the Alternatives on Air Quality").

Effects to employee hearing would be adverse and moderate due to quieter machines. Employees and visitors may choose to wear hearing protection to mitigate these impacts.

THE EFFECTS OF IMPLEMENTING THE ALTERNATIVES ON NATURAL SOUNDSCAPES

METHODS

Acoustic Characteristics of Oversnow Vehicles

The following sections provide information on the acoustic attributes of OSVs, including the measured sound levels for various OSVs and modeled results based on these measurements. Analyses using models provide information that is sometimes impossible or impractical to get through actual measurements. Modeling is, however, dependent on the accuracy of the data used and generally untested assumptions. Although the resulting models may appear precise and quantitative, they are susceptible to errors resulting from faulty assumptions. The purpose of the modeling used here is to provide relative data that can be used to compare the alternatives.

Oversnow Vehicle Sound Levels

Harris Miller Miller & Hanson, Inc. (HMMH), under contract with the NPS, conducted vehicle pass- by measurements of OSVs (Menge and Ross 2002). The purpose was to supplement and update the data collected in 2000 for the EIS, and to measure the sound levels of a variety of OSVs, including four- stroke snowmobiles, which were not available for evaluation in the Final EIS. The study concluded that four- stroke snowmobiles were quieter than two- stroke snowmobiles. The quietest snowcoach was the two- track conversion van; the loudest was the Bombardier with high exhaust. This study was used to establish BAT requirements.

Other studies have been conducted by Bowlby & Associates (1996), HMMH (2001) and Jackson Hole Scientific Investigations, Inc. (Daily 2002). These studies were discussed in the Final EIS, and summarized in SEIS, and are incorporated in this EA by reference. The 2002 HMMH study also provided measurements of the frequency spectra of the vehicles, data which is useful to understand sound impacts.

Table 36 provides a summary of the measured maximum pass- by A- weighted sound levels for most of the snow machines that were measured, grouped by vehicle type and target speed (Menge and Ross 2002). Much of the sound generated from snowcoaches (particularly the Mattracks) appeared to be generated by the interaction of the vehicles treads with the snow, and the snow in the test zone had become fairly rough by the end of the testing day. The rough snow probably caused the track- related sound levels of some of the snowcoaches tested later in the day to be somewhat higher than they would have been under smoother snow conditions, and could also have affected the measured sound levels of the later- tested snowmobiles.

Table 36. Measured sound levels of OSV pass- bys at 50 feet, Yellowstone National Park, February 6, 2002.

Vehicle Type	Target Speed (mph)	Average Measured Speed	Average L_{MAX} (dB, fast)	Median L_{MAX} (dB, fast)	Highest L_{MAX} (dB, fast)	Lowest L_{MAX} (dB, fast)	Number of Vehicle Events
Snowcoaches	20	20.9	70.7	71.6	75.8	63.6	24
4- stroke Snowmobiles	20	18.5	66.1	65.9	67.6	64.5	26

2- stroke Snowmobiles	20	18.4	71.0	71.3	73.1	68.9	12
Snowcoaches	30[†]	29.0	74.8	75.3	80.5	68.8	20
4- stroke Snowmobiles	35	31.6	71.8	71.9	73.1	70.2	22
2- stroke Snowmobiles	35	31.9	74.0	74.2	76.8	71.3	14
4- stroke Snowmobiles	45	40.2	73.1	72.9	75.5	71.3	27
2- stroke Snowmobiles	45	40.3	75.8	76.3	77.2	73.3	14

[†]All snowcoaches targeted 30 mph except the gas- powered Mattracks, which targeted 35 mph but achieved 32 mph.

Vehicle Volumes and Roadway Segment Details

The distance to audibility and sound level depends on the intervening terrain. Table 37 provides the details on the segment lengths for each roadway and the percentage of each road segment that is "open" and "forested" terrain. Details on the soundscape characteristics of the different terrain types can be found in Section 2.4 of the Final EIS noise technical report. The average daily vehicle volumes estimated for the alternatives are listed in Appendix 1 of the Final EIS.

Table 37. Roadway segment lengths, percentage open and forested terrain.

Roadway Segment	Length (miles)	Percentage Open (%)	Percentage Forested (%)
1. Mammoth to Northeast Entrance	47	68	32
2. Mammoth to Norris	21	16	84
3. West Entrance to Madison	14	3	97
4. Madison to Norris	14	5	95
5. Norris to Canyon Village	12	0	100
6. Canyon Village to Fishing Bridge	16	29	71
7. Fishing Bridge to East Entrance	27	17	83
8. Fishing Bridge to West Thumb	21	50	50
9. Madison to Old Faithful	16	6	94
10. Old Faithful to West Thumb	17	0	100
11. West Thumb to Flagg Ranch	24	11	89
12. Grassy Lake Road	7.6	19	81
13. Flagg Ranch to Colter Bay	15.6	40	60
14. Colter Bay to Moran Junction	10.2	25	75
15. Moran Junction to east entrance	2	50	50
16. Moran Junction to South Entrance	26	98	2
17. Teton Park Road	15	65	35
18. Moose- Wilson Road	2.5	63	37
19. Jackson Lake	9.7	100	0

Audibility of OSV Operation

Table 38 presents the computed distances to the limits of audibility of a single pass- by of each type of OSV and different size groups of snowmobiles in open terrain (or lightly forested) and in forested terrain (moderately to heavily) for both average and quiet background conditions. This table was prepared for poor sound conditions, i.e., firm snow with downwind or temperature inversion atmospheric conditions, which increase the distance sound travels. Table 39 presents the same information computed under ideal sound conditions, i.e., soft snow with calm winds and temperature lapse conditions, which decrease the distance sound travels. The computations can be interpreted as follows: beyond the distance shown, vehicles would not be audible; at the distance shown, vehicles would be barely audible for only a few seconds; closer than the distance shown, vehicles would be more clearly audible and for a longer time.

Differences in the distances to limit of audibility between the average and quiet background conditions are relatively small because the difference in the background sound levels are relatively small. The difference in distances between open terrain and forested terrain is generally larger because sound levels drop off more quickly with distance in the forested environment. Differences in distances to limit of audibility between ideal and poor atmospheric and snow conditions are substantial due to the substantial effect of atmospheric and snow conditions on sound propagation. The sound levels of different vehicle types were most similar when the distances were computed with the best- case propagation conditions.

The shortest distances to the limits of audibility are generated by automobiles and the two- track conversion van snowcoaches because these vehicles are relatively quiet, they do not show tonal characteristics, and they produce relatively little low- frequency energy. a group of 12 snowmobiles is expected to be audible when it is two to three times farther away than a single snowmobile operating at the same individual pass- by level.

Table 38. Distances to limits of audibility for vehicle pass- bys over snow in open and forested terrain, in average and quiet background conditions, and under poor atmospheric and snow conditions.

Vehicle Type	Maximum 50 ft Pass- by Level (dB)	Distance to Limit of Audibility (feet)			
		Open Terrain		Forested Terrain	
		Average Bkgrnd	Quiet Bkgrnd	Average Bkgrnd	Quiet Bkgrnd
Automobile	68	2,180	2,330	1,130	1,200
Bus	76	5,520	6,090	2,620	2,860
Bombardier Snowcoach	79	11,830	13,420	5,200	5,720
(BAT) 2- Track Conversion Van Snowcoach	69.7	2,630	2,800	1,360	1,440
Mountain Max Snowmobile	74.6	2,110	2,270	1,160	1,260
(BAT) Arctic Cat Snowmobile	71.9	3,250	3,410	1,610	1,670
(BAT) Group of 2 Snowmobiles	71.9 each	4,320	4,540	2,060	2,140
(BAT) Group of 4 Snowmobiles	71.9 each	5,810	6,120	2,660	2,770
(BAT) Group of 8 Snowmobiles	71.9 each	7,920	8,340	3,480	3,630
(BAT) Group of 12 Snowmobiles	71.9 each	9,550	10,070	4,100	4,280

Table 39. Distances to limits of audibility for vehicle pass- bys over snow in open and forested terrain and in average and quiet background conditions under ideal atmospheric and snow conditions.

Vehicle Type	Maximum 50- ft Pass-by Level (dB)	Distance to Limit of Audibility (feet)			
		Open Terrain		Forested Terrain	
		Average Bkgrnd	Quiet Bkgrnd	Average Bkgrnd	Quiet Bkgrnd
Automobile	68	850	860	680	680
Bus	76	1,160	1,170	910	910
Bombardier Snowcoach	79	1,480	1,660	960	1,000
(BAT) 2- Track Conversion Van Snowcoach	69.7	900	1,000	580	600
Mountain Max Snowmobile	74.6	1,190	1,390	740	850
(BAT) Arctic Cat Snowmobile	71.9	1,010	1,180	650	700
(BAT) Group of 2 Snowmobiles	71.9 each	1,180	1,390	750	810
(BAT) Group of 4 Snowmobiles	71.9 each	1,380	1,630	860	940
(BAT) Group of 8 Snowmobiles	71.9 each	1,620	1,920	1,000	1,090
(BAT) Group of 12 Snowmobiles	71.9 each	1,780	2,110	1,090	1,200

Definition of Impacts to the Natural Soundscape

The natural soundscape is an intrinsic resource or value of park lands, and includes all of the sounds of nature absent any sounds from human sources. Audibility (whether a sound can be heard within the natural soundscape), sound level (amount of sound energy or "loudness" of the sound), and time factors (duration, frequency of occurrence, and timing) of non- natural sound affected the impact on the natural soundscape. The definition of impact levels takes these factors into consideration. The impact levels for audibility are based on those in the Final EIS and Final SEIS., but include new categories for management areas that better represent the patterns of impact on natural soundscapes. The potential sound levels from OSVs are controlled in all alternatives through the BAT requirements, designated travel routes, and daily entry limits. The maximum sound level standard acknowledges the importance of how sound levels impact the natural soundscape. How the listener is affected qualitatively by non- natural sound is a subjective issue not dealt with here. Table 40 defines impacts to the natural soundscape by their magnitudes.

Table 40. Definition of oversnow vehicle impacts to the natural soundscape.

Impact Category Definition[1]	Management Area	Audibility[2, 3]	Maximum Sound Level[3,4]
No Effect An action that does not affect the natural soundscape or the potential for its enjoyment.	n/a	n/a	n/a
Adverse Negligible Effect An action that may affect the natural soundscape or potential for its enjoyment, but with infrequent	Developed	Sound created by action is audible < 25%	Maximum sound level created by action is < 45 dBA

occurrence and only for short duration at low sound levels. Unique soundscape characteristics such as bubbling hot springs or geysers are rarely affected.	Travel Corridor	< 15%	< 40dBA
	Backcountry	<5%	<40 dBA
Adverse Minor Effect An action that may affect the natural soundscape or potential for its enjoyment.	Developed	>25% <45%	<60 dBA
	Travel Corridor	>15% <25%	<60 dBA
	Backcountry	>5% <10%	<40 dBA
Adverse Moderate Effect An action that may affect the natural soundscape or potential for its enjoyment.	Developed	>45% <75%	<70 dBA
	Travel Corridor	>25% <50%	<70 dBA
	Backcountry	>10% <20%	<45 dBA
Adverse Major Effect An action with an easily recognizable adverse effect on the natural soundscape and potential for its enjoyment.	Developed	>75%	>70 dBA
	Travel Corridor	>50%	>70 dBA
	Backcountry	>20%	>45 dBA

[1]Definitions apply to all hours of operation, but daily averages are calculated for 8 A.M. to 4 P.M. Thresholds are measured at 100 feet.
[2]Audibility is the ability to hear a certain sound.
[3]To be assigned to an impact category, audibility and maximum sound level thresholds cannot be exceeded on more than 15% of the measurement days.
[4]Typical natural sound levels on a calm winter day may range from 0 to 30 dBA. BAT sound level requirements of 73 dBA measured at 50 feet is roughly equivalent to 67 dBA at 100 feet. The maximum sound level for all non- natural sounds in national parks other than OSVs and motorboats is 60 dBA (36 CFR: Ch. 1 (2.12) p.21- 22. 1 July 2003).

Methodology for Determining Impacts

Potential impacts are described in terms of type (beneficial or adverse), context (site- specific, local, or regional), duration (short- term, lasting less than one year, or long- term, lasting more than one year), timing (seasonal), and intensity (negligible, minor, moderate, or major).

Three of the five alternatives in this EA are different than those that were analyzed for the EIS and SEIS, and because quantitative data are unavailable to adequately compare the five alternatives, this analysis will present mainly qualitative comparisons. This analysis uses information derived from quantitative studies referenced in Chapter III and is largely based on soundscape monitoring done during the 2002- 2003 and 2003- 2004 seasons. The 2003- 2004

season was substantially different from the previous winter in that: 1) at least 80% of snowmobiles met NPS BAT requirements; 2) all snowmobiles traveled with commercial guides; and 3) there were fewer snowmobiles in the parks. The result of these differences was readily apparent in the soundscape monitoring data (Burson 2004).

The objective of this planning process was to accommodate the historical number of visitors during the winter season in each alternative, although the number of vehicles and types of vehicles transporting visitors varies among the alternatives. The impact to the natural soundscape from automotive traffic on paved and plowed roads in Yellowstone, Grand Teton and the Parkway should not differ among the alternatives and is beyond the scope of this EA. Therefore, automobile traffic will not be addressed further in this impact analysis.

The impacts by OSVs to the natural soundscape depend on a number of variables including number of vehicles, sound emitted from the vehicles, guiding requirements, group size, spacing, and speed. Obviously, more vehicles are audible for a greater percentage of time and are louder than fewer vehicles. Snowmobiles that remain grouped together rather than individually spread out reduces the percent time audible at any one point along a travel route and increases the time when only natural sounds are audible. As group size increases, the overall sound level increases, but this increase is offset by the reduction in audibility between the presence of groups. Sound levels increase as OSV speed increases; lower speeds reduce the distance to audibility and sound levels where the snowmobile is audible.

ALTERNATIVE 1

This alternative assumes a daily entrance of 146 snowcoaches in YNP, which would continue historical visitation levels. This figure was calculated based on an historical average of 80,315 snowmobile passengers, plus 11,462 snowcoach passengers, divided by 7 passengers per snowcoach, divided by 90 days in an average winter season. This figure is likely somewhat conservative since many snowcoaches carry more than seven passengers, and visitation is unlikely to rebound to historic levels within the interim period of this EA.

Audibility

- *Developed Areas:* 259 vehicles per day were on average audible 61% of the day (from 8 A.M. to 4 P.M.) at Old Faithful during the 2003- 2004 season. If 146 snowcoaches entered YNP each day, it is reasonable to assume this average would be significantly less, because of the decrease in vehicle numbers. Although the two- track conversion van is quieter than a BAT snowmobile, all other types of snowcoaches are somewhat louder.
- Snowcoaches would rarely be audible more than 50% of the historically busiest hours (from 11 A.M. and 3 P.M.) at Old Faithful.
- *Road Corridors:* Along the busiest road corridors, such as road segments between the South Entrance and West Entrance, snowcoaches would occasionally be audible throughout the day. Along less traveled road corridors, snowcoaches would rarely be audible.
- The modeling done for the Final SEIS found that in both poor and ideal sound propagation conditions, snowcoaches would not be audible 50% or more of the day on any road segments. This modeling illustrated that in worst case conditions (under which snowcoaches would affect more areas), snowcoaches would be audible more than 10% of the day on all but three road segments: Mammoth to Norris, Fishing Bridge to East Entrance, and Fishing Bridge to West Thumb. Under ideal sound propagation conditions, OSVs would not be

audible on any road segments more than 10% of the day, except West Entrance to Madison. (These figures assume average background noise in open terrain.)

- *Backcountry areas:* During the winter of 2003- 2004 at Lone Star Geyser Basin, which is approximately one mile from roadways, OSVs were audible 4% of the day with an average of 236 snowmobiles and 20 snowcoaches in the park. However, OSVs may be more or less frequently audible in backcountry areas that are further from roadways, due to open meadows, forests, topography, wind, temperature inversions, etc. Snowcoaches might be occasionally audible in backcountry areas. Some snowcoach sounds may travel further in the backcountry than snowmobile sounds, but these intrusions would be rare.

Maximum Sound Level

In destination areas and travel corridors, snowcoaches under rapid acceleration may occasionally exceed 70 dBA as measured at 100 feet.

Jackson Lake, CDST, and Grassy Lake Road

This alternative does not permit snowmobile use on Jackson Lake, the CDST, or Grassy Lake Road so there would be no impacts to natural soundscapes on the lake or these road segments resulting from snowmobile use.

Conclusion

Some impacts to the natural soundscape could be mitigated through training of snowcoach guides. For example, guides could decrease their speed in sensitive areas (e.g., from 35 mph to 25 mph), which would have a moderate effect on soundscapes. In addition, guides can ensure their vehicles do not idle in visitor areas.

Compared to historical conditions, this alternative would have major beneficial impacts to natural soundscapes. There would generally be minor adverse effects in developed areas and roadway corridors, as OSVs would not be audible more than 45% of the day in developed areas and 25% of the day in travel corridors. In developed areas and along road corridors, there could be occasional moderate adverse effects when OSVs are rapidly accelerating and maximum sound levels could exceed 70dBA. In backcountry areas, there would be negligible effects, as OSVs would not be audible more than 5% of the day. Impacts to the natural soundscape would be short- term and would be eliminated with at the end of the season.

Impacts to the natural soundscape associated with alternative 1 would not be of sufficient magnitude to constitute impairment to park resources and values.

ALTERNATIVE 2

This alternative assumes a daily entrance of 318 snowmobiles and 87 snowcoaches in YNP, which would continue historical visitation levels.

Audibility

- *Developed Areas:* 259 vehicles per day were on average audible 61% of the day (from 8 A.M. to 4 P.M.) at Old Faithful during the 2003- 2004 season. If 318 snowmobiles, plus 87

snowcoaches entered YNP each day, it is reasonable to assume this average would be somewhat higher.
- OSVs would often be audible more than 50% of each hour from 11 A.M. and 3 P.M. at Old Faithful.
- *Road Corridors:* Along the busiest road corridors, such as road segments between the South Entrance and West Entrance, OSVs could be audible as much as 50% of the day and as much as 80% of peak hours, based on monitoring during the 2003- 2004 season. Along less traveled road corridors, OSVs would be much less audible.
- *Backcountry areas:* During the 2003- 2004 season at Lone Star Geyser Basin, which is approximately one mile from roadways, OSVs were audible 4% of the day with 236 snowmobiles in the park. However, OSVs may be more or less frequently audible in backcountry areas that are further from roadways, due to open meadows, forests, topography, wind, temperature inversions, etc.

Effects of Commercial Guiding Requirements

- Commercial snowmobile guides tend to average approximately 8 snowmobiles per group, but sometimes have as many as 11 in a group. Because of the daily entry limits and the fact that commercially guided snowmobiles travel in relatively large groups, snowmobile sound is more concentrated, and there are longer periods when snowmobile sound is not audible. Consequently, the snowmobile percent time audible decreases as snowmobile group size increases. Under this alternative, there would be approximately 40 groups in the YNP each day due to the daily entry limit of 318 snowmobiles.
- Commercially guiding requirements create predictable visitation patterns. For example, commercially guided groups tend to enter YNP between 8 A.M. and 10 P.M., arrive at Old Faithful between 11 A.M. and 3 P.M., and often depart Old Faithful by 4 P.M. In this scenario, there would be periods when OSVs would be less audible in the morning at Old Faithful and in the evening. In addition, there would be periods during mid- day near park entrances when OSV sound was less audible.

Maximum Sound Level

In destination areas and travel corridors, snowmobiles and snowcoaches under rapid acceleration may occasionally exceed 70 dBA as measured at 100 feet.

Jackson Lake, CDST, and Grassy Lake Road

Under this alternative, the use of snowmobiles would not be permitted on Jackson Lake. Snowmobile use on the CDST and Grassy Lake Road would be limited to 25 per day on each route.

During the winter of 2003- 2004, snowmobiles were audible at Old Faithful 61% of the time between the hours of 8:00 a.m. and 4:00 p.m. This level of audibility resulted from the average use of 259 snowmobiles per day. Since the daily entry limits for the CDST and Grassy Lake Road would be far less than the Old Faithful figure, and historical use indicates that these limits would be approached on only a few days, it is expected that the snowmobiles would be audible only occasionally as a result of recreational use on these routes.

Conclusion

Some impacts to the natural soundscape could be mitigated through speed reduction and training of snowcoach and snowmobile guides. For example, guides could decrease their speed in sensitive areas (e.g., from 35 mph to 25 mph), which would have a moderate effect on soundscapes. In addition, guides can ensure that their snowcoaches and snowmobile groups do not accelerate too rapidly or idle in visitor and other sensitive areas.

Compared to the historical condition of unlimited snowmobile use, this alternative would have major beneficial impacts to natural soundscapes. There would be moderate adverse effects in developed areas, roadway corridors, and backcountry areas as OSVs would not be audible more than 75% of the day in developed areas, 50% of the day in travel corridors, and 20% of the day in backcountry areas. Impacts to the natural soundscape would be short- term and would be eliminated at the end of the season.

Impacts to the natural soundscape associated with alternative 2 would not be of sufficient magnitude to constitute impairment to park resources and values.

ALTERNATIVE 3

This alternative assumes a daily entrance of 540 snowmobiles and 45 snowcoaches in YNP, which would continue historical visitation levels.

Audibility

- This alternative allows 95 unguided snowmobiles per day (approximately 18% of daily entries). These unguided snowmobiles would somewhat negate the benefits of group travel because they would average 5 snowmobiles per group, whereas commercially guided groups average 8 snowmobiles. This would increase the percent time snowmobiles are audible in developed areas, road corridors, and backcountry locations.
- *Developed Areas:* 259 vehicles per day were on average audible 61% of the day (between 8 A.M. and 4 P.M.) at Old Faithful during the 2003- 2004 season. If 540 snowmobiles entered YNP each day, it is reasonable to assume this average would be higher, especially given the number of unguided snowmobiles.
- OSVs would often be audible more than 60% of each hour between 11 A.M. and 3 P.M. at Old Faithful.
- *Road Corridors:* Along the busiest road corridors, such as road segments between the South Entrance and West Entrance, OSVs could occasionally be audible more than 50% of the day and more than 80% of peak hours, based on monitoring during the 2003- 2004 season. Along less traveled road corridors, OSV sound would be less audible, although more audible than alternative 2 due to increased vehicle numbers and the presence of unguided snowmobile groups.
- *Backcountry areas:* During the 2003- 2004 season at a site 4,000 feet from the Madison to Old Faithful Road, OSVs were audible 13% of the day with 403 snowmobiles in the park. This alternative would allow a third more snowmobiles than this use level, which would increase the percent time snowmobiles are audible in backcountry areas. OSVs may be more or less frequently audible in backcountry areas that are further from roadways, due to open meadows, forests, topography, wind, temperature inversions, etc.

Effects of Commercial Guiding Requirements

- Commercial snowmobile guides tend to average approximately 8 snowmobiles per group, but sometimes have as many as 11 in a group. Because of the daily entry limits and the fact that commercially guided snowmobiles travel in relatively large groups, snowmobile sound is more concentrated, and there are longer periods when snowmobile sound is not audible. Consequently, the snowmobile percent time audible decreases as snowmobile group size increases. Under this alternative, there would be approximately 56 commercially guided groups in the YNP each day and 19 unguided groups. These unguided groups contribute to a disproportionately large impact on the natural soundscape.
- Commercially guided groups tend to enter YNP between 8 A.M. and 10 A.M., arrive at Old Faithful between 11 A.M. and 3 P.M., and often depart Old Faithful by 4 P.M. In this scenario, there would be periods when OSVs would be less audible in the morning at Old Faithful and in the evening. In addition, there would be periods during mid- day near park entrances when OSV sound was less audible. However, this alternative allows 95 unguided snowmobiles per day, which do not have the visitation patterns of commercially guided snowmobiles. This factor may be somewhat offset near park entrances by the requirement that snowmobiles enter the park by 10:30 A.M..

Maximum Sound Level

In destination areas and travel corridors snowmobiles and snowcoaches under rapid acceleration may occasionally exceed 70 dBA as measured at 100 feet.

Jackson Lake, CDST, and Grassy Lake Road

Under this alternative, snowmobile use on Jackson Lake, the CDST, and Grassy Lake Road would be limited to 25 per day on each.

During the winter of 2003- 2004, snowmobiles were audible at Old Faithful 61% of the time between the hours of 8:00 a.m. and 4:00 p.m. This level of audibility resulted from the average use of 259 snowmobiles per day. Since the daily entry limits for the CDST and Grassy Lake Road would be far less than the Old Faithful figure, and historical use indicates that these limits would be approached on only a few days, it is expected that snowmobiles would be audible only occasionally as a result of recreational use on these routes. Although the flat and unbroken surface of Jackson Lake would allow sounds to carry over longer distances, and therefore potentially be audible more of the time, this would be mitigated by the BAT requirement, as well as the fact that snowmobiles would only be in use during the time it takes to travel to and from ice fishing areas.

Conclusion

Some impacts to the natural soundscape could be mitigated through speed reduction and training of snowcoach and snowmobile guides. For example, guides could decrease their speed in sensitive areas (e.g., from 35 mph to 25 mph), which would have a moderate effect on soundscapes. In addition, guides can ensure that their snowcoaches and snowmobile groups to do not accelerate too rapidly or idle in visitor and other sensitive areas. However, the allowance for 18% of the daily snowmobile entries to travel unguided offsets this benefits.

Compared to historical conditions, this alternative would have moderate beneficial impacts to natural soundscapes.

Under alternative 3, there would be moderate adverse effects in developed areas. On average days, OSVs would be audible 65- 75% of the day. On some peak days, OSVs could occasionally be audible more than 75% of the day, largely due to the allowance of unguided snowmobiles. On roadway corridors, OSVs would generally not be audible more than 50% of the day, but could exceed this occasionally, resulting in moderate adverse effects. In backcountry areas, there would be moderate adverse effects, as snowmobiles would be audible less than 20% of the day. Impacts to the natural soundscape would be short- term and would be eliminated at the end of the season.

Impacts to the natural soundscape associated with alternative 3 would not be of sufficient magnitude to constitute impairment to park resources and values.

ALTERNATIVE 4

This alternative assumes a daily entrance of 720 snowmobiles and 18 snowcoaches in YNP, which would continue historical visitation levels.

Audibility

- *Developed Areas:* 259 vehicles per day were on average audible 61% of the day (from 8 A.M. to 4 P.M.) at Old Faithful during the winter of 2003- 2004. On peak days, when 720 snowmobiles could enter YNP – nearly triple the average of the 2003- 2004 winter season – it is reasonable to assume this average would be above 75% of the day. On non- peak days, when fewer snowmobiles would enter the park (e.g., 300- 540), snowmobiles would be audible between 65 and 75% of the day.
- OSVs may often be audible more than 75% of each hour from 10 A.M. to 4 P.M. at Old Faithful, especially on peak days when the daily snowmobile entry limits of 720 are approached.
- *Road Corridors:* On peak days along the busiest road corridors, such as road segments between the South Entrance, Old Faithful, and West Entrance, OSVs could be audible more than 50% of the day, and more than 90% of peak hours. Along less traveled road corridors, and on days when fewer snowmobiles enter the park, OSV sound would be less audible, although more audible than alternatives 2 and 3 due to increased numbers.
- *Backcountry areas:* During the 2003- 2004 season at a site 4,000 feet from the Madison to Old Faithful Road, OSVs were audible 13% of the day with 403 snowmobiles in the park. This alternative would allow 75% more snowmobiles than this use level, which would increase the percent time snowmobiles are audible in backcountry areas. OSVs may be more or less frequently audible in other backcountry areas that are further from roadways, because of open meadows, forests, topography, wind, temperature inversions, etc.

Effects of Commercial Guiding Requirements

- Commercial snowmobile guides tend to average approximately 8 snowmobiles per group, with as many as 11 in a group. Because of the daily entry limits and the fact that commercially guided snowmobiles travel in relatively large groups, snowmobile sound is more concentrated, and there are longer periods of time where snowmobile sound is not audible. Consequently, the percent time audible decreases as snowmobile group size increases. Under this alternative, there would be approximately 90 commercially guided groups in the YNP each day.

- Commercially guiding requirements create predictable visitation patterns. For example, commercially guided groups tend to enter YNP between 8 AM and 10 A.M., arrive at Old Faithful between 11 A.M. and 3 P.M., and depart Old Faithful often by 4 P.M. In this scenario, there would be periods when OSVs would be less audible in the mornings at Old Faithful and in the evening. In addition, there would be periods during the mid- day near park entrances when OSV sound was less audible.

Maximum Sound Level

In destination areas and travel corridors, snowmobiles and snowcoaches under rapid acceleration may occasionally exceed 70 dBA as measured at 100 feet.

Jackson Lake, CDST, and Grassy Lake Road

Under this alternative, snowmobile use on Jackson Lake would be limited to 40 per day, while the CDST and Grassy Lake Road would be limited to 50 per day on each route.

During the winter of 2003- 2004, snowmobiles were audible at Old Faithful 61% of the time between the hours of 8:00 a.m. and 4:00 p.m. This level of audibility resulted from the average use of 259 snowmobiles per day. Since the daily entry limits for the CDST and Grassy Lake Road would be far less than the Old Faithful figure, and historical use indicates that these limits would be approached on only a few days, it is expected that snowmobiles would be audible only occasionally as a result of recreational use on these routes. Although the flat and unbroken surface of Jackson Lake would allow sounds to carry over longer distances, and therefore potentially be audible more of the time, this would be mitigated by the BAT requirement, as well as the fact that snowmobiles would only be in use during the time it takes to travel to and from ice fishing areas.

Conclusion

Compared to historical conditions, this alternative would have moderate beneficial impacts to natural soundscapes because of the requirements for using BAT and commercial guides. These gains are offset by the fact that this alternative allows 720 snowmobiles per day in YNP, which is close to the historical daily average of 765.

As noted above, impacts to the natural soundscape are mitigated by alternative 4's requirement that all snowmobilers travel with commercial guides. Some impacts to the natural soundscape could be further mitigated through speed reduction and training of snowcoach and snowmobile guides. For example, guides could decrease their speed in sensitive areas (e.g., from 35 mph to 25 mph), which would have a moderate effect on soundscapes. In addition, guides can ensure that their snowcoaches and snowmobile groups to do not accelerate too rapidly or idle in visitor and other sensitive areas.

On average days under alternative 4, it is expected that approximately 300- 540 snowmobiles would enter YNP. The soundscapes analysis indicates that 318- 540 commercially guided snowmobiles (under alternatives 2 and 3) cause moderate adverse effects on natural soundscapes. However, on peak days, such as Saturdays and the holidays of Presidents Day, Martin Luther King, Jr., Christmas, and New Year's, visitation could approach the daily entry limit of 720 snowmobiles. These days would yield major adverse effects in developed areas, where OSVs would be audible more than 75% of the day. However, given the interim nature of

this EA, it is not expected that visitation would routinely approach the daily entry limit of 720 snowmobiles, as this is a significant increase compared to the winters of 2002- 2003 and 2003- 2004. Instead, it is likely that visitation would more closely resemble the levels of the 2002- 2003 and 2003- 2004 winter seasons, with approximately 318- 540 snowmobiles in YNP on average days. Peak days are expected to account for less than 15% of the winter season (during a 90- day winter season, there are approximately 9 Saturdays from January thru mid- March during the peak season, plus holidays). Thus, the impacts remain moderate because the peak days and their attendant major adverse effects, would occur less than 15% of the winter season.

There would also be moderate adverse effects on roadway corridors on most days of the winter season, when approximately 300- 540 snowmobiles would enter YNP on average. On these days, OSVs would be audible less than 50% of the day. On peak days, when snowmobiles numbers may approach the daily entry limit of 720, OSVs would be audible more than 50% of the day, resulting in major impacts on those peak days. Similarly, in backcountry areas, snowmobiles would occasionally be audible more than 20% of the day on peak days, resulting in moderate adverse effects. Impacts to the natural soundscape would be short- term and would be eliminated at the end of the season.

Impacts to the natural soundscape associated with alternative 4 would not be of sufficient magnitude to constitute impairment to park resources and values.

ALTERNATIVE 5

This alternative assumes a daily entrance of 950 snowmobiles and 18 snowcoaches in YNP, which would continue historical visitation levels.

Audibility

- This alternative allows 190 non- commercially guided snowmobiles per day (20% of the daily entrance limit). These non- commercially guided snowmobiles would negate the benefits of group travel, since private snowmobile groups average 5 snowmobiles per group, whereas commercially guided groups average 8 snowmobiles. This would consequently increase the percent time snowmobiles are audible in developed areas, road corridors, and backcountry locations.
- *Developed Areas:* 259 vehicles per day were on average audible 61% of the day (between 8 A.M. and 4 P.M.) at Old Faithful during the 2003- 2004 season. If 950 snowmobiles entered YNP each day, it is reasonable to assume this average would be much higher. Data collected during the 2002- 2003 season indicates that 750 snowmobiles in the park were audible 93% of the day at Old Faithful, but this included a significant number of non- BAT snowmobiles, which would increase audibility.
- OSVs may often be audible more than 90% of each hour between 9 A.M. and 4 P.M. at Old Faithful.
- *Road Corridors:* Along the busiest road corridors, such as road segments between the South Entrance and West Entrance, OSVs could be audible most of the day and more than 90% of peak hours. Along less traveled road corridors, OSV sound would be less audible, although more audible than alternatives 2, 3 and 4 due to increased numbers.
- The modeling done for the SEIS found that under poor sound propagation conditions, OSVs would be audible 50% or more of the day on seven road segments (West Entrance to Madison, Madison to Norris, Norris to Canyon Village, Fishing Bridge to East Entrance,

Madison to Old Faithful, Old Faithful to West Thumb, and West Thumb to Flagg Ranch). Under ideal sound propagation conditions, OSVs would be audible on two road segments 50% or more of the day (West Entrance to Madison and Madison to Old Faithful). Further, this modeling illustrated that in both worst and best case conditions, OSVs would be audible more than 10% of the day on all oversnow road segments. (These figures assume average background noise in open terrain.)

- *Backcountry areas:* During the 2003- 2004 season at a site 4,000 feet from the Madison to Old Faithful Road, OSVs were audible 13% of the day with 403 snowmobiles in the park. Alternative 5 would allow more than double this use level, which would significantly increase the percent time snowmobiles are audible in backcountry areas. OSVs may be more or less frequently audible in other backcountry areas that which are further from roadways, due to open meadows, forests, topography, wind, temperature inversions, etc.

Effects of Commercial Guiding Requirements

- Commercial snowmobile guides tend to average approximately 8 snowmobiles per group, with as many as 11 in a group. Because of the daily entry limits and the fact that commercially guided snowmobiles travel in relatively large groups, snowmobile sound is more concentrated, and there are longer periods when snowmobile sound is not audible. Consequently, the percent time audible decreases as snowmobile group size increases. Under this alternative, there would be approximately 95 commercially guided groups and 38 groups with non- commercial guides in YNP each day.
- Commercially guided groups tend to enter YNP between 8 A.M. and 10 A.M., arrive at Old Faithful between 11 A.M. and 3 P.M., and often depart Old Faithful often by 4 P.M. However, this alternative allows 190 non- commercially unguided snowmobiles per day, which do not have the visitation patterns of commercially guided snowmobiles. There may be periods when OSVs would be less audible in the mornings at Old Faithful and in the evening, although these periods would be less predictable than in alternatives 2, 3, or 4 due to the presence of snowmobiles without commercial guides. There may be periods during the mid-day near park entrances when OSV sound would be less audible, but this would also be less predictable.

Maximum Sound Level

In destination areas and travel corridors, snowmobiles and snowcoaches under rapid acceleration may occasionally exceed 70 dBA as measured at 100 feet.

Jackson Lake, CDST, and Grassy Lake Road

Under this alternative, snowmobile use on Jackson Lake would be limited to 40 per day, while the CDST and Grassy Lake Road would be limited to 75 per day on each.

During the winter of 2003- 2004, snowmobiles were audible at Old Faithful 61% of the time between the hours of 8:00 a.m. and 4:00 p.m. This level of audibility resulted from the average use of 259 snowmobiles per day. Since the daily entry limits for the CDST and Grassy Lake Road would be far less than the Old Faithful figure, and historical use indicates that these limits would be approached on only a few days, it is expected that snowmobiles would be audible only occasionally as a result of recreational use on these routes. Although the flat and unbroken surface of Jackson Lake would allow sounds to carry over longer distances, and therefore be audible more of the time, this would be mitigated by the BAT requirement, as well as the fact that snowmobiles would only be in use during the time it takes to travel to and from ice fishing areas.

Conclusion

Some impacts to the natural soundscape could be mitigated through speed reduction and training of snowcoach and snowmobile guides. For example, guides could decrease their speed in sensitive areas (e.g., from 35 mph to 25 mph), which would have a moderate effect on soundscapes. In addition, guides can ensure that their snowcoaches and snowmobile groups to do not accelerate too rapidly or idle in visitor and other sensitive areas.

Compared to historical conditions, this alternative has several features that would mitigate impacts to natural soundscapes through daily entrance limits and the requirements that snowmobiles use BAT and 80% of snowmobilers travel with commercial guides. These gains are offset by the fact that this alternative allows 950 snowmobiles per day in YNP compared to the historical daily average of 765. However, this alternative eliminates the peak use associated with historical snowmobile use and its attendant impacts.

Under Alternative 5, there would be major adverse effects in developed areas, where OSVs would routinely be audible more than 75% of the day. There would also be major adverse effect on roadway corridors, where OSVs would routinely be audible more than 50% of the day. In backcountry areas, snowmobiles would be audible more than 20% of the day, resulting in major adverse effects. Impacts to the natural soundscape would be short- term and would be eliminated at the end of the season.

Impacts to the natural soundscape associated with alternative 5 would not be of sufficient magnitude to constitute impairment to park resources and values.

SUMMARY OF IMPACTS TO THE NATURAL SOUNDSCAPE

Table 41 summarizes impacts to natural soundscapes. All of the alternatives have the potential to adversely effect natural soundscapes, albeit to varying degrees. Alternative 1 yields the least amount of impact, due to the mass transit nature of snowcoaches and the consequentially decreased number of vehicles operating in the parks.

Table 41. Summary of impacts to the natural soundscape.

Alternative	Developed Areas	Roadway Corridors	Backcountry
1	Minor adverse effects generally. Occasional rapid acceleration may create noise levels over 70 dBA, which would be a moderate effect, but could be mitigated through guide training.	Minor adverse effects. OSVs would routinely be audible less than 25% of the day.	Negligible adverse effects. OSVs would rarely be audible in backcountry locations.
2	Moderate adverse effects. OSVs would be audible less than 75% of the day, but more than 45% of the day.	Moderate adverse effects. OSVs would periodically be audible more than 25% of the day, but less than 50% of the day.	Minor adverse effects. OSVs would be audible less than 10% of the day in backcountry locations.
3	Moderate adverse effects. OSVs would be periodically be audible more than 75% of the day.	Moderate adverse effects. Snowmobiles would be audible more than 25% of the day, but less than 50% of the day. Occasional days	Moderate adverse effects. OSVs would be audible less than 20% of the day in backcountry

		could exceed 50% audibility.	locations.
4	Moderate adverse effects. On occasional peak days, OSVs would be audible more than 75% of the day.	Moderate adverse effects. On occasional peak days, OSVs would be audible more than 50% of the day.	Moderate adverse effects. OSVs would periodically be audible more than 20% of the day in backcountry locations.
5	Major adverse effects. OSVs would routinely be audible more than 75% of the day.	Major adverse effects. OSVs would routinely be audible more than 50% of the day.	Major adverse effects. OSVs would be audible more than 20% of the day in backcountry locations.

THE EFFECTS OF IMPLEMENTING THE ALTERNATIVES ON SOCIOECONOMICS

METHODS

Regional economic impacts were estimated for each of the proposed alternatives in five areas: the five- county area (Fremont County in Idaho, Gallatin and Park counties in Montana, and Park and Teton counties in Wyoming); the three- state area (Wyoming, Montana, and Idaho); and three cities (West Yellowstone, Montana; Jackson, Wyoming; and Cody, Wyoming). The IMPLAN software system, based on the Bureau of Economic Analysis regional input- output model, was used to estimate these impacts, as implemented in the NPS Winter Use Model (Duffield and Neher, 2002).

Additionally, this analysis estimated economic impacts relative to two baselines: historic snowmobile use (1997- 1998 winter season) and a snowmobile ban. The rationale for using these two baselines flows from the December 16, 2003, ruling of the Washington, D.C., District Court and the February 10, 2004, ruling of the Wyoming District Court. These two rulings potentially imply the two baselines used in this analysis. In order to cover the potential range of analyses suggested by these rulings, NPS used historic snowmobile use from the 1997- 1998 winter season and a snowmobile ban as alternative baselines to estimate the economic impacts of its proposed temporary winter use plan alternatives. NPS believes that the actual economic impacts of the proposed temporary winter use plan alternatives fall within the range of impacts estimated relative to these two baselines, and described in this section.

It cannot be predicted exactly how visitation levels at the parks may change as a result of the restrictions placed on snowmobile use. For example, non- snowmobile visitation may increase because some people will find that the absence or reduced number of snowmobiles results in a more enjoyable park visit for other activities. Therefore, the possible socioeconomic effects of each alternative have been estimated using both a "low- impact" and a "high- impact" scenario. The assumptions used to create the scenarios and generate the economic impacts are shown in Table 42a. In general, the default levels incorporated in the Winter Use Model were used, but they were modified where necessary to reflect the daily snowmobile maximums and the number

of excluded snowmobilers who are predicted to shift to less crowded days, or the number of snowmobilers who will snowmobile in the GYA outside the parks if they cannot or do not want to snowmobile in the parks. It is important to account for these visits, because to the extent that these people still engage in winter recreation in the GYA despite the restrictions on snowmobiling in the parks, the economic impacts of a particular alternative will be reduced.

The Winter Use Model relies on historic snowmobile use during the 1997- 1998 winter season as its baseline. That baseline represents only one of the two alternative baselines addressed in this analysis. However, since the Winter Use Model relies on that baseline, the scenarios developed for each alternative are described below relative to historic snowmobile use. Economic impacts for that baseline are reported in Table 42a. The economic impacts relative to a snowmobile ban are then reported in Table 42b as incremental differences between the impacts reported in Table 42a for Alternative 1 (snowmobile ban) and the impacts calculated for the remaining alternatives.

The high- impact scenario for each alternative assumes that:

- No snowmobilers who are excluded because of the daily limit will shift to another day.
- 40% of the snowmobilers representing the average historical snowmobiles visitation (765 per day) level who do not want to snowmobile in the parks because of the restrictions or who are excluded from snowmobiling in the parks because of the daily limits will still visit the parks for other activities or return to the GYA to recreate outside the park.

The low- impact scenario for each alternative assumes that:

- 74% of the historical snowmobile visitation level will continue to engage in winter recreation in the GYA despite the restrictions on snowmobiles in the parks (based on data from the 2002- 2003 Winter Visitor Survey (NPS, 2003)).
- All snowmobilers who are excluded because of the daily limit will shift to a less crowded day.
- Total visitation will increase 2.25% as a result of additional non- snowmobile visitors.

Another modification to the Winter Use Model was needed for the high- impact scenario in order to reflect the likely impact of the snowmobile guide requirements. In the 2002- 2003 Winter Visitor Survey conducted in Yellowstone, approximately 38% of the snowmobilers said they would not visit the park if guided tours were required, even with the provision for 20% non- commercially guided snowmobiles. This issue was addressed by calculating hypothetical daily entrance limits that would yield a 38% decline in visitation. For comparison, visitation under the caps proposed in the alternatives was also calculated assuming that no snowmobile riders switch their trips to less crowded days. The high- impact scenario used the assumptions that generated the largest reduction in visitation.

ECONOMIC IMPACTS RELATIVE TO HISTORIC SNOWMOBILE USE

The management alternatives analyzed in this EA may affect the local economy in several ways, including changes in park visitation, sales, and profits of local businesses, local employment, and local and state sales tax revenue. Restricting the use of snowmobiles relative to the baseline of 1997–1998 visitation in Yellowstone is expected to decrease economic activity in the region around the park. The following sections describe the estimated economic impacts on five areas (the three- state area, the five- county area, and three specific cities) where the majority of the effects from reduced visitation to Yellowstone will be felt. Impacts are largest in the three- state area, but the majority of the impacts are centered on the five counties surrounding the park (including Fremont County in Idaho, Gallatin and Park counties in Montana, and Park and

Teton counties in Wyoming). Three cities were also modeled separately based on the importance of snowmobiles to the local economy.

To put the economic impact data in perspective, as noted in the Final SEIS, the estimated total economic output of the three states is $125 billion; of the five counties, is $6.4 billion; and for West Yellowstone, $112 million.

CHANGES IN PARK VISITATION

Table 42a, Line 8, presents the results of the impact analysis on visitation. Alternative 1 prohibits snowmobile use in the parks and generates a predicted decline in visitation between 43 and 16 percent. The other alternatives generate declines between 27 percent and a very slight increase in visitation under the Alternative 5 low- impact scenario.

The anticipated decrease in the number of visitor- days is primarily because of the expectation that some people who previously visited to use their snowmobiles will no longer visit the park or will reduce their length of stay because of the restrictions on snowmobile use. The actual decrease in park visitation depends on several factors. Snowmobile riders may shift their trips to less- crowded days when the daily entrance limits are not binding. Some people who previously used snowmobiles in Yellowstone may choose to continue visiting the park to enjoy alternative winter activities available within Yellowstone and Grand Teton, such as cross- country skiing, show- shoeing, winter hiking, and scenic driving. Some visitors may continue to visit the GYA but recreate outside the park. Many snowmobile riders currently spend more days riding outside Yellowstone than inside the park. As mentioned earlier, visitation by non- snowmobile visitors may increase because the absence of snowmobiles will create a more enjoyable outdoor experience for some members of this group. This increased visitation would partially offset the loss in snowmobile users.

In the model, expectations about the behavior of snowmobile riders and other visitors are captured by the assumptions about the extent to which snowmobile riders can distribute their trips more evenly across the winter season (Line 2 of Table 42a), the increase in visitation by other people who do not currently visit the park (Line 3 of Table 42a), and the percentage of snowmobile riders who will come to the park to participate in other activities or continue to visit the GYA to recreate outside the park (Table 42a, Line 4). Based on these numbers, Table 42a, shows the change in snowmobile visitation based on the daily limits and the percentage of riders who switch to less- crowded days (Line 5), the adjusted change in snowmobile visitation accounting for the number of snowmobile riders who switch to other activities in the park or continue to visit the GYA outside the park (Line 6), the total change in visitation by current visitors including visitors who do not ride snowmobiles (Line 7), and the total change in visitation compared to historical levels plus the additional non- snowmobile visitation assumed in the low impact scenario (Line 8).

LOCAL BUSINESS OUTPUT

As a result of the incremental reductions in visitation to the Yellowstone area expected under the alternatives relative to the historic snowmobile use baseline, there could be a corresponding reduction in the value of local business output. The primary sectors that are affected by

reductions in winter visitation are the tourism sectors, including snowmobile sales and rental shops, restaurants, and retailers. Although the direct impact of a reduction in visitor spending is primarily felt in these sectors, many additional sectors of the economy will be affected to some extent through secondary impacts. This EA focused on the impacts estimated for the first winter use season after implementation of the rule. Impacts in subsequent years will be very similar.

The direct impact on business output (or revenues) was estimated for each scenario by multiplying the reduction in visitation by spending. The default assumption for the Winter Use Model is $555 per person per trip. The resulting estimated economic impact under each scenario is shown in Table 42a, Line 9. The direct effect of the regulation on the regional economy plus the indirect and induced effects (ripple effects on input suppliers and from changes in household income, respectively) are estimated using the Winter Use Model.

The high- impact scenario for Alternative 1 generated the largest predicted decline of $30,473,119 for the three- state area. The high- impact scenarios for Alternatives 2 and 3 actually generate larger losses than the low- impact scenario in Alternative 1 through the combination of low daily entrance limits and the assumption that only 40% of current snowmobile riders will return to the GYA versus 74 percent in the low- impact scenarios.

The results for Alternative 4 illustrate the potential impact of the guided tour requirement clearly. Under this alternative, the daily limits are relatively high, and in the low- impact scenario, where all the snowmobile riders are assumed to switch their trips to days when the limits are not binding and visitation by non- snowmobile riders increases, the overall decline in visitation is only 0.2 percent. However, based on the results of the 2002–2003 Winter Visitor Survey (NPS, 2003), which suggests that only 38 percent of current snowmobile riders would return to the park if they had to take a guided tour, the predicted decline in visitation is 16 percent in the high- impact scenario.

When compared to the various local economic units, the impact of all alternatives ranges from negligible (for the three states, five counties, and Cody) to minor for Jackson and West Yellowstone. Although minor in a larger context, these economic losses will be real to the businesses, individuals, families, and governments that are directly and indirectly affected by the loss of economic activity.

LOCAL EMPLOYMENT

Lower employment is one consequence of the lower business output that could result from the predicted visitation decline under all but one of the scenarios given the historic snowmobile use baseline. These changes are calculated by IMPLAN based on ratios of sales to employment for the affected industries in the different regions. As a result of the decrease in sales anticipated, companies will need fewer employees. The estimated reduction in employment for the five-county area calculated using the Winter Use Model ranges from 3 to 740 employees, except Alternative 5's low- impact scenario, for which the model predicts a slight increase. Table 42a, Line 10, summarizes the results of the employment analysis. The results are similar in relative magnitude to the changes in direct spending.

When put into the perspective of the various local economic units, the impacts range from negligible to minor. Despite the relative small effect on overall employment, these impacts

would be real for the persons and their families affected and will result in disruption of families, neighborhoods, and businesses, especially in the communities nearest the parks.

ECONOMIC IMPACTS RELATIVE TO A SNOWMOBILE BAN

The economic impacts of the proposed alternatives were also estimated relative to a snowmobile ban. The difference between these economic impacts and the economic impacts reported in above and in Table 42a relate solely to a change in the baseline from which the economic impacts are measured. As reported in Table 42a, the economic impacts relative to historic snowmobile use are generally negative. That results from the additional management restrictions imposed by Alternatives 1 through 5 relative to the historic snowmobile use during the 1997- 1998 winter use season. However, the economic impacts relative to a snowmobile ban are positive for Alternatives 2 through 5 since those alternatives permit snowmobile use. Alternative 1 represents the snowmobile ban. Aside from the difference in baseline, all other assumptions regarding visitation, spending, and the multipliers used to calculate business output and employment impacts remain unchanged from those presented in Table 42a.

The economic impacts relative to a snowmobile ban are calculated as the incremental differences between the impacts presented in Table 42a for Alternative 1 (snowmobile ban) and the impacts calculated for the remaining alternatives. For example, given the historic snowmobile use baseline, the employment impact of the Alternative 1 high- impact scenario is a loss of 635 jobs, and that of the Alternative 2 high- impact scenario is a loss of 395 jobs. Therefore, the employment impact of the Alternative 2 high- impact scenario relative to a snowmobile ban is a *gain* of 240 jobs (635 minus 395). The calculation is similar for the business output impacts.

The estimated economic impacts relative to a snowmobile ban are presented in Table 42b. The high- impact scenario of Alternative 5 generates the largest gain in business output ($20,173,535) of all alternative scenarios examined. Alternatives 4, 3, and 2 generate increasingly smaller gains, respectively. The gains associated with Alternative 5 are approximately twice the gains associated with Alternative 2. The gains in employment are similar in relative magnitude for these alternatives.

SUMMARY

Two different measures of the economic impacts resulting from the proposed temporary winter use plan alternatives are presented in this section: business output and employment. Each measure provides slightly different information about the expected economic effects on the region. Additionally, this analysis estimates economic impacts relative to two baselines: historic snowmobile use and a snowmobile ban. Two recent district court rulings potentially imply these two baselines. NPS believes that the actual economic impacts of the proposed temporary winter use plan alternatives fall within the range of impacts estimated and presented in this report.

Given the historic snowmobile use baseline, NPS estimates that the total impacts of the temporary winter use plan alternatives on the three- state area range from a decrease of $30.5 million to an increase of $1.6 million in the first year. The reductions in output under the high- impact scenario for Alternative 1, which bans snowmobiles, are about four times greater than the losses predicted under the Alternative 5 high- impact scenario. For Alternatives 1 through 3, the high- impact scenario generates losses between approximately 2.5 and 4.5 times greater than the

low- impact scenario. The difference between the high- and low- impact scenarios is greatest for Alternative 4, where losses are over 69 times greater in the high- impact scenario. Assuming the historic snowmobile use baseline, the low- impact scenario for Alternative 5 is the only alternative that actually generates gains based on the prediction that snowmobile visitation will not change, but non- snowmobile visitation will increase.

Given the snowmobile ban baseline, the estimates of the total impacts for Alternatives 2 through 5 on the three- state area range from an increase of $5.7 million to an increase of $22.9 million in the first year. The gains associated with Alternative 5 are approximately twice that of the gains associated with Alternative 2.

UNCERTAINTY

A number of factors will affect the regional economic impacts associated with the alternatives analyzed in this EA. Two scenarios were developed for each alternative to show the impacts of different assumptions. Although the results are the NPS's best estimate of the economic impacts, numerous sources of uncertainty may influence the results. Some of the main sources of uncertainty include the following.

The projections are based on visitation during the 1997–1998 winter season. This visitation level was chosen in part because visitation in more recent years has been affected by regulatory uncertainty. However, past trends in snowmobile visitation may not be a good predictor of future visitation to the parks by snowmobilers. Projecting past trends into the future may understate or overstate the change in Yellowstone snowmobile use that will actually occur. The number of snowmobilers who will visit the GYA after a revised winter use plan goes into effect is unknown, but the 2002–2003 Winter Visitor Survey suggests that many current snowmobile visitors may not return if guided tours are required or snowmobiles are banned. The actual number of snowmobilers who visit may be higher or lower than assumed in this analysis. The spending patterns and multipliers used in the Winter Use Model were derived from IMPLAN to represent economic activity in the Yellowstone area. To the extent that spending patterns of future visitors in Yellowstone differ from these assumptions and local economic changes indicate different multipliers, the economic impacts may be understated or overstated. For example, if the mix of visitors changes from predominantly snowmobile riders to other types of visitors, spending patterns may change. In addition, there are the usual uncertainties and caveats associated with the use of input- output models. Similarly, this analysis assumes that the business output and employment multipliers will not change between the different policy alternatives examined. To the extent that the different policy alternatives affect the local economy in different ways, yielding different multipliers, the actual impacts may be understated or overstated. The estimates included in Tables 42a and 42b only apply to the first year the alternative goes into effect, and they do not take into consideration the effects of marketing and advertising that may occur as a result of changes in the park's winter use policies or how people's behavior may or may not change in subsequent years as a result of those efforts.

Table 42a. Assumptions and estimated economic impacts, comparison of alternatives.

	Alternative 1		Alternative 2		Alternative 3		Alternative 4		Alternative 5	
1. Snowmobile maximum daily limits in Yellowstone	High	Low	High	Low	High	Low	High	Low	High	Low
West Entrance	0	0	160	160	290	290	433	400	543	550
South Entrance	0	0	121	121	146	146	127	220	177	250
East Entrance	0	0	22	22	50	50	23	40	43	100
North Entrance	0	0	15	15	32	32	15	30	19	20
Old Faithful Entrance	0	0	0	0	22	22	—	30	6	30
2. Percentage of excluded snowmobilers who will shift to less crowded days	0%	0%	0%	100%	0%	100%	0%	100%	0%	100%
3. Percentage increase in non- snowmobile visitors	0%	2.25%	0%	2.25%	0%	2.25%	0%	2.25%	0%	2.25%
4. Percentage of snowmobilers who will switch to other activities in the park or visit the GYA to recreate outside the parks	40.4%	74.3%	40.4%	74.3%	40.4%	74.3%	40.4%	74.3%	40.4%	74.3%
5. Unadjusted change in snowmobile visitors	−72,705	−72,705	−45,258	−41,242	−32,877	−25,262	−27,463	−9,812	−18,072	0
	−100%	−100%	−62%	−57%	−45%	−35%	−38%	−13%	−25%	0%
6. Adjusted change in snowmobile visitors	−43,332	−18,685	−26,974	−10,599	−19,595	−6,492	−16,368	−2,522	−10,771	0
	−60%	−26%	−37%	−15%	−27%	−9%	−23%	−3%	−15%	0%
7. Total change in current winter visitation including both snowmobile riders and other visitors	−43,332	−18,685	−26,974	−10,599	−19,595	−6,492	−16,368	−2,522	−10,771	0
	−43%	−18%	−27%	−10%	−19%	−6%	−16%	−2%	−11%	0%

(continued)

Table 42a. Comparison of Assumptions and Estimated Impacts for Proposed Alternatives (continued)

	Alternative 1		Alternative 2		Alternative 3		Alternative 4		Alternative 5	
	High	Low	High	Low	High	Low	High	Low	High	Low
8. Total change in modeled winter visitation including increases in non- snowmobile visitors	−43,332	−16,399	−26,974	−8,313	−19,595	−4,206	−16,368	−235	−10,771	2,286
	−43%	−16%	−27%	−8%	−19%	−4%	−16%	−0.2%	−11%	2%
9. Total local business impact (in 1997 dollars)										
Five counties	−26,846,632	−10,159,960	−16,711,689	−5,150,311	−12,140,028	−2,605,880	−10,140,873	−145,813	−6,673,097	1,416,524
Three states	−30,473,119	−11,532,384	−18,969,132	−5,846,024	−13,779,923	−2,957,886	−11,510,719	−165,509	−7,574,510	1,607,870
West Yellowstone	−9,481,119	−3,588,077	−5,901,877	−1,818,877	−4,287,355	−920,289	−3,581,337	−51,495	−2,356,662	500,258
Jackson	−6,731,308	−2,547,427	−4,190,154	−1,291, 348	−3,043,893	−653,377	−2,542,641	−36,560	−1,673,159	355,168
Cody	−171,863	−65,041	−106,983	−32,971	−77,716	−16,682	−64,918	−933	−42,719	9,068
10. Total employment impact										
Five counties	−635	−240	−395	−122	−287	−62	−240	−3	−158	33
Three states	−740	−280	−461	−142	−335	−72	−280	−4	−184	39
West Yellowstone	−227	−86	−142	−44	−103	−22	−86	−1	−57	12
Jackson	−161	−61	−100	−31	−73	−16	−61	−1	−40	9
Cody	−4	−2	−3	−1	−2	−0	−2	−0	−1	0

Table 42b Estimated Impacts of Proposed Alternatives Relative to a Snowmobile Ban

	Alternative 2		Alternative 3		Alternative 4		Alternative 5	
	High	Low	High	Low	High	Low	High	Low
5. Unadjusted change in snowmobile visitors	27,447	31,463	39,828	47,443	45,242	62,893	54,633	72,705
6. Adjusted change in snowmobile visitors	16,358	8,086	23,737	12,193	26,964	16,163	32,561	18,685
7. Total Change in Current Winter Visitation including both snowmobile riders and other visitors	16,358	8,086	23,737	12,193	26,964	16,163	32,561	18,685
8. Total change in modeled winter visitation including increases in the number of non-snowmobile visitors	16,358	8,086	23,737	12,193	26,964	16,163	32,561	18,685
9. Total local business impact (in 1997 dollars)								
Five- county	10,134,942	5,009,649	14,706,604	7,554,080	16,705,759	10,014,147	20,173,535	11,576,484
Three- state	11,503,987	5,686,361	16,693,196	8,574,498	18,962,400	11,366,875	22,898,610	13,140,254
West Yellowstone	3,579,242	1,769,201	5,193,764	2,667,788	5,899,783	3,536,582	7,124,458	4,088,335
Jackson	2,541,154	1,256,079	3,687,415	1,894,049	4,188,667	2,510,867	5,058,150	2,902,594
Cody	64,881	32,070	94,147	48,359	106,945	64,107	129,144	74,109
10. Total employment impact								
Five- county	240	118	348	179	395	237	477	274
Three- state	279	138	405	208	461	276	556	319
West Yellowstone	86	42	125	64	141	85	171	98
Jackson	61	30	88	45	100	60	121	70
Cody	2	1	2	1	3	2	3	2

Alternative 1 is not shown in this table since it represents the baseline and therefore has zero impacts. Line numbers used in this table are consistent with those used in Table 42a. Line numbers 1 through 4 are not shown in this table since they relate to the calculation of visitation relative to historic snowmobile use

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THE EFFECTS OF IMPLEMENTING THE ALTERNATIVES ON VISITOR ACCESS AND CIRCULATION

The impacts of a range of winter use alternatives on visitor access and circulation are disclosed in the Final EIS and the Final SEIS and that information is incorporated in this EA by reference.

While NPS policies for Yellowstone and Grand Teton have tended to emphasize visitor experiences based on the quality of park resources rather than the mode of transport used to access them, the mode of travel that a visitor prefers is not necessarily related to intrinsic park values. This section therefore addresses the impact of changes in mode of access separately from impacts relating specifically to visitor experience.

ALTERNATIVE 1

Alternative 1 is intended to allow access to Yellowstone at historical visitation levels, although it differs markedly from historical conditions in that motorized oversnow access would be permitted only by snowcoach. Some people for whom the experience of traveling independently on a snowmobile is important may choose not to visit the parks because the type of access and experience they prefer is no longer be available. The impact of alternative 1 would be adverse for these potential visitors compared to historical conditions. Similarly, some potential visitors to Grand Teton National Park and the Parkway would be adversely affected because they would no longer have the opportunity to travel on the CDST or Grassy Lake Road, or access Jackson Lake by snowmobile.

Snowcoaches are generally reliable but slower than snowmobiles. Consequently, the pace of a typical Yellowstone visit would be slower, and visitors may not be able to tour as much of the park in a single day as is possible by snowmobile. However, snowcoach operators have offered full- day tours that are nearly identical to the most popular snowmobile tours. All park areas would remain accessible, and visitors could travel to the same attractions such as Old Faithful and the Lower Falls. Snowcoach tours from the East Entrance to Old Faithful are considerably longer than they are by snowmobile, but only a very small portion of Yellowstone visitors use the East Entrance; most visitors use the West Entrance or South Entrance, from most park attractions are easily accessible by snowcoach in a day in good weather.

Sylvan Pass will remain a problematic route within the park even with the helicopter- based avalanche control program. Extended closures are expected to continue to occur in the future in order to ensure visitor and employee safety. Under all alternatives, but especially alternative 1, the route over Sylvan Pass will need to be maintained to an even higher standard than for just snowmobiles because of the weight and size of the snowcoaches, and this may result in longer closures.

For Grand Teton National Park and the Parkway, the use of snowmobiles would be prohibited on both the CDST and the Grassy Lake Road. Since the route of the CDST follows the shoulder of U.S. 26/287 and U.S. 89/287, visitors could still access this area by wheeled vehicles on the plowed road surface. The frozen surface of Jackson Lake and Grassy Lake Road could only be visited by non- motorized travel.

ALTERNATIVES 2, 3, 4, AND 5

These alternatives would all permit access to Yellowstone at historical visitation levels through a combination of snowmobile and snowcoach access. Some people for whom the experience of traveling independently (i.e., without a guide) on a snowmobile is important may choose not to visit the parks because the type of access and experience they prefer is no longer be available. The impact of any of these alternatives would be adverse for these potential visitors, but the number of people affected would vary among the alternatives. Some visitors who would prefer to visit by snowmobile but are unable to do so because of the daily entry limits may choose instead to visit by snowcoach. Although these people would still have access to the park, they may be adversely affected because the snowcoach tour was not their preference. The number of visitors for whom access to the park by snowcoach would be their only choice would be highest under alternatives 2 and 3, but even under alternatives 3 and 4 some visitors may be limited to snowcoach access if the daily snowmobile limit is reached. Some people may opt instead to visit the park on a less busy day, travel to a different entrance where the daily snowmobile limit has not been reached (although the driving distance between the park entrances in the winter would make this impractical in most cases), or decide not to visit the park at all.

All park roads would remain open under these alternatives, so visitors would continue to have access to the park's major features and visitor circulation through the parks would remain largely unchanged. These alternatives would have the same effects on snowcoach travel, including that over Sylvan Pass, as alternative 1.

In Grand Teton and the Parkway, visitors would continue to be able to use snowmobiles on the CDST, Grassy Lake Road, and, except in alternative 2, the frozen surface of Jackson Lake. Flagg Ranch would also continue to be accessible by motorized vehicles.

The effects of alternatives 2, 3, and 4 on visitor access and circulation would be short- term (the duration of this interim period), minor, direct, and localized. Effects of alternative 5 would be short- term (the duration of this interim period), negligible (because 950 snowmobiles per day is more than the historical average, visitors desiring to snowmobile on all but the busiest days would be able to), direct, and localized.

THE EFFECTS OF IMPLEMENTING THE ALTERNATIVES ON VISITOR EXPERIENCE

METHODS

This analysis of the impacts on visitor experience is limited to the features of each alternative that pertain to OSV access to the parks and use of groomed roads and trails. It is also limited to the key indicators of visitor experience for which new information and analysis may alter the assessment of impacts that were disclosed in the Final EIS and the Final SEIS, and for which impacts may vary by alternative. The analysis of impacts on visitor experience discussed in the Final SEIS and the Final EIS remains valid and is incorporated here by reference.

This assessment is based on visitor surveys that have indicated the most important factors in determining the quality of visitors' experience in the parks:

- Opportunities to view wildlife
- Opportunities to view scenery
- Safety
- Educational opportunities
- Quality of the groomed roads
- Opportunities for quiet and solitude
- Clean air

These indicators of visitor satisfaction were derived from: Littlejohn (1996); Friemund (1996); Borrie and Friemund (1997); Borrie et al. (1999); Davenport (1999); and Duffield et al. (2000a. 2000b, and 2000c); and the Wyoming Snowmobile Survey (2001). Other winter use surveys and assessments from Teton County, Wyoming, the states of Wyoming, Montana and Idaho, and the parks were used to validate the criteria. See Final SEIS Chapter III, Visitor Experience, for a more detailed discussion of the survey data used in this analysis. Table 43 shows the definitions for impacts to visitor experience.

Table 43. Definition of impacts to visitor experience.

Impact Category	Definition
Negligible	Little noticeable change in visitor experience.
Minor	Changes desired experiences but without appreciably limiting or enhancing critical characteristics of the experience.
Moderate	Changes critical characteristics of the desired experience or reduces or increases the number of visitors.
Major	Eliminates, detracts from or greatly enhances multiple critical characteristics of the desired experience or greatly reduces or increases visitation.
Neutral	Creates no change in the defined indicators of visitor satisfaction or quality of park experience.

Regulations and policies for management of visitor activities underlie the analysis determinations presented in the following analysis. Section 8.2 Visitor Use from the National Park Service Management Policies 2001 provides specific direction.

Impacts on Visitor Experience Common to All Alternatives

The use of helicopters for avalanche control increases the number of overflights of Yellowstone National Park and nearby U.S. Forest Service lands for administrative purposes. Some visitors may find the sight and sound of the helicopter objectionable and a factor that reduces the quality of their park experience. These avalanche control overflights are expected to occur about 10 times per winter. However, the road is closed from the East Entrance to Fishing Bridge during avalanche control operations by either helicopter or howitzer, and the route is checked to make sure that no visitors are in the road corridor. An occasional backcountry user may see or hear the helicopter or howitzer, these impacts are expected to be negligible.

ALTERNATIVE 1

Opportunities to View Wildlife. Most winter visitors rate wildlife viewing as a primary or important reason for visiting the parks. Under alternative 1, visitors would continue to have outstanding opportunities to view bison, elk, trumpeter swans, and other wildlife. Since this alternative requires that all visitors travel on snowcoaches, wildlife viewing opportunities would be enhanced compared to historical conditions because the snowcoaches are driven by trained guides who are familiar with the movements and locations of various wildlife species.

While snowcoach guides routinely make impromptu stops to view wildlife, visitors may not have the ability to view wildlife for as long as they would choose if they were traveling on their own. Visitors who wish to stop in one area for an extended period to view wildlife would be adversely affected by this alternative unless they charter a private snowcoach tour.

Although wildlife monitoring has shown that winter use has not had population- level impacts on any wildlife species (White et. al 2004), the effect of OSV travel on individual animals has been controversial with the public. Many park visitors have little desire to view wildlife that appears to be disturbed by human activities. Under alternative 1, the number of vehicles traveling through the parks would decline significantly, which would result in fewer situations where wildlife are disturbed or harassed by them. Although snowcoaches are more likely to disturb individual wildlife than snowmobiles because of their larger size, this factor would be more than offset by the fact that there would be so many fewer vehicles.

Opportunities to View Scenery. Snowcoach guides' familiarity with the parks enables them to direct visitors to areas of special interest, which would have a minor beneficial impact. However, the viewing experience for OSV access would change substantially. Visitors for whom the freedom to stop and view scenery whenever they want is essential to their park experience would be adversely affected by this alternative. The Grassy Lake Road area would be limited to non- motorized use.

Safety. Snowcoach- only travel would eliminate the risk of snowmobile accidents and snowmobile/skier conflicts. The decrease in vehicle miles traveled would substantially reduce the likelihood of OSV accidents. No large mammals were hit by snowcoaches or buses in Yellowstone from 1989 to 1998 (Gunther et al. 1998). Snowcoach guides are required to be equipped with two- way radios for emergency use and to have first aid and CPR training. The overall effect of alternative 1 would therefore be moderate to major improvements in visitor safety compared to historical conditions.

Educational Opportunities. This alternative would significantly enhance the educational opportunities for visitors to learn about the parks because it requires that all visitors travel with trained guides who are knowledgeable about the park's history, wildlife, thermal features, and other resources. The interaction with their guide is often one of the memorable parts of the trip for snowcoach riders.

Quality of the Groomed Roads. The heavier weight and larger tracks of snowcoaches than snowmobiles means that they have greater effects on the quality of groomed oversnow roads. However, because the total number of vehicles would be reduced, a major improvement in groomed roads quality would be expected compared to historical conditions.

Quiet and Solitude. Because of the significant decrease in the number of OSVs operating on the roadways, opportunities for quiet and solitude would be greatly enhanced throughout the park, especially along road corridors and in developed areas such as Old Faithful. Visitors traveling through the park would see far fewer other parties, and those stopping along the road, such as to view wildlife at a pullout, would have longer and more frequent periods of natural quiet (see the section on natural soundscapes in this chapter). Visitors walking along boardwalks at developed areas would also have much greater opportunities for quiet and solitude. Visitors cross- country skiing or snowshoeing away from roads would have greater opportunities for quiet and solitude without traveling so far from the roadway. (Under historical conditions, visitors must travel miles from the nearest road before they escape the sound of OSV recreation. This would result in major beneficial impacts to visitor experience compared to historical conditions.

Clean Air. Because snowcoaches have sophisticated automobile engines with technologically advanced pollution control equipment, this alternative would result in major beneficial impacts to park air quality compared to historical conditions, especially in staging areas and along travel corridors. In addition, the air quality analysis done for the Final SEIS indicated that impacts to visibility in the parks attributable to OSV recreation would not be present if snowmobiles were eliminated.

Conclusion. Alternative 1 would have major, direct, beneficial impacts to the experiences of park visitors compared to historical conditions. Visitors would have far more opportunities to experience clean air, solitude and natural quiet in the parks. Because all visitors would travel on snowcoaches driven by expert guides, they would have significantly more opportunities to learn about park resources. In addition, there would be major, direct, beneficial impacts to safety and the quality of groomed roads. Disturbances to wildlife from OSVs would be reduced, which would enhance visitor opportunities to view wildlife.

The impacts associated with alternative 1 would not be of sufficient magnitude to constitute impairment of visitor experience.

ALTERNATIVE 2

Opportunities to View Wildlife. Most winter visitors rate wildlife viewing as a primary or important reason for visiting the parks. Under Alternative 2, visitors would continue to have outstanding opportunities to view bison, elk, trumpeter swans, and other wildlife. Wildlife viewing opportunities would be enhanced compared to historical conditions because all OSV visitors would be required to be accompanied by trained guides who are familiar with the movements and locations of various wildlife species.

While snowcoach and snowmobile guides routinely make impromptu stops to view wildlife, visitors may not have the ability to view wildlife for as long as they would choose if they were traveling on their own. Visitors who wish to stop in one area for an extended period to view wildlife would be adversely affected by this alternative unless they charter a private snowcoach or snowmobile tour.

Although wildlife monitoring has shown that winter use has not had population- level impacts on any wildlife species (White et al. 2004), the effect of OSV travel on individual animals has been controversial with the public. Many park visitors have little desire to view wildlife that appears to be disturbed by human activities. Under alternative 2, the number of OSVs traveling

through the parks would decline significantly, which would result in fewer situations where wildlife are disturbed or harassed by them. In addition, all snowmobile visitors would be led by a commercial guide who can ensure that they do not disturb wildlife or pass animals on or near the road until it is appropriate to do so.

Opportunities to View Scenery. Snowcoach and snowmobile guides' familiarity with the parks enables them to direct visitors to areas of special interest, which would have a minor beneficial impact. However, the viewing experience for OSV access would change substantially. Visitors for whom the freedom to stop and view scenery whenever they want is essential to their park experience would be adversely affected by this alternative unless they charter a private snowcoach or snowmobile tour.

Safety. The decrease in vehicle miles traveled and the requirement that all snowmobilers travel with commercial guides would reduce the likelihood of motor vehicle accidents and enhance visitor safety. Snowcoach and snowmobile guides are required to have first aid and CPR training, and they are usually equipped with two- way radios for emergency use. The overall effect of alternative 2 would therefore be moderate to major improvements in visitor safety compared to historical conditions. Compared to alternative 1, there would be minor adverse effects to safety due to the presence of more vehicles.

Educational Opportunities. This alternative would significantly enhance the educational opportunities for visitors to learn about the parks because it requires that all visitors travel with trained guides who are knowledgeable about the park's history, wildlife, thermal features, and other resources. The interaction with their guide is often one of the memorable parts of the trip for snowmobile and snowcoach riders.

Quality of the Groomed Roads. This alternative would significantly improve the quality of groomed oversnow roads because the total number of OSVs would be reduced by more than half the historical average of 765 snowmobiles per day in Yellowstone.

Quiet and Solitude. Because of the significant decrease in the number of OSVs operating on the roadways, opportunities for quiet and solitude would be greatly enhanced throughout the park, especially along road corridors and in developed areas such as Old Faithful. Visitors traveling through the park would see far fewer other parties, and those stopping along the road, such as to view wildlife at a pullout, would have longer and more frequent periods of natural quiet (see the section on natural soundscapes in this chapter). Visitors walking along boardwalks at developed areas would also have much greater opportunities for quiet and solitude. Visitors cross- country skiing or snowshoeing away from roads would have greater opportunities for quiet and solitude without traveling so far from the roadway. (Under historical conditions, visitors must travel miles from the nearest road before they escape the sound of OSV recreation). This would result in major beneficial impacts to visitor experience compared to historical conditions. Compared to alternative 1, there would be moderate adverse effects because of the larger number of OSVs permitted under alternative 2.

Clean Air. Because this alternative requires that all snowmobiles meet BAT requirements, there would be major beneficial impacts to park air quality compared to historical conditions, especially in staging areas and along travel corridors.

Conclusion. Alternative 2 would have major, direct beneficial impacts to the experiences of park visitors compared to historical conditions. Visitors would have far more opportunities to

experience clean air, solitude and natural quiet in the parks. Because both snowmobile and snowcoach visitors would be led by trained guides, they would have significantly more opportunities to learn about park resources. In addition, there would be moderate beneficial impacts to safety. Disturbances to wildlife from OSVs would be reduced, which would enhance visitor opportunities to view wildlife. Compared to alternative 1, this alternative would have direct, moderate adverse impacts on visitor experience because increased vehicle numbers would affect opportunities for quiet and solitude and the quality of the groomed roads.

The impacts associated with alternative 2 would not be of sufficient magnitude to constitute impairment of visitor experience.

ALTERNATIVE 3

Opportunities to View Wildlife. Most winter visitors rate wildlife viewing as a primary or important reason for visiting the parks. Under Alternative 3, visitors would continue to have outstanding opportunities to view bison, elk, trumpeter swans, and other wildlife. Wildlife viewing opportunities would be enhanced compared to historical conditions because approximately 82% of snowmobilers would be required to travel with commercial guides who are familiar with the movements and locations of various wildlife species.

This alternative would allow approximately 18% of snowmobilers to travel in YNP without commercial guides. While these visitors would enjoy the opportunity to travel throughout the park at their own leisure, they would not have the added benefit of a commercial guide. This may result in fewer opportunities to view wildlife for these visitors.

Although wildlife monitoring has shown that winter use has not had population- level impacts on any wildlife species (White et al. 2004), the effect of OSV travel on individual animals has been controversial with the public. Many park visitors have little desire to view wildlife that appears to be disturbed by human activities. Under alternative 3, the number of OSVs traveling through the parks would decline, which would result in fewer situations where wildlife are disturbed or harassed by them. In addition, most snowmobile visitors would be led by a commercial guide who can ensure that they do not disturb wildlife or pass animals on or near the road until it is appropriate to do so.

Opportunities to View Scenery. Snowcoach and snowmobile guides' familiarity with the parks enables them to direct visitors to areas of special interest, which would have a minor beneficial impact. However, the viewing experience for OSV access would change substantially. Some visitors who wish to travel at their own pace would be allowed to do so, as this alternative allows approximately 18% of snowmobile entries to be unguided.

Safety. The decrease in vehicle miles traveled and the requirement that most snowmobilers travel with commercial guides would reduce the likelihood of motor vehicle accidents and enhance visitor safety. Snowcoach and snowmobile guides are required to have first aid and CPR training, and they are usually equipped with two- way radios for emergency use. The overall effect of alternative 3 would therefore be moderate improvements in visitor safety compared to historical conditions. Compared to alternative 1, there would be moderate adverse effects to safety due to the presence of unguided snowmobilers.

Educational Opportunities. This alternative would significantly enhance the educational opportunities for visitors to learn about the parks because it requires that 82% of all snowmobile visitors travel with trained guides who are knowledgeable about the park's history, wildlife, thermal features, and other resources. The interaction with their guide is often one of the memorable parts of the trip for snowmobile and snowcoach riders. For snowmobilers traveling without guides, there would be no change in educational opportunities compared to historical conditions. Compared to alternative 1, there would be minor adverse effects in educational opportunities because some snowmobilers would be traveling without guides.

Quality of the Groomed Roads. This alternative would significantly improve the quality of groomed oversnow roads because the total number of OSVs would be reduced by 30% from the historical average of 765 snowmobiles per day in Yellowstone. However, on warm days with poor snow cover, there could be minor to moderate adverse effects on the quality of the groomed road surface.

Quiet and Solitude. Because of the decrease in the number of OSVs operating on the roadways, opportunities for quiet and solitude would be greatly enhanced throughout the park, especially along road corridors and in developed areas such as Old Faithful. Visitors traveling through the park would see far fewer other parties, and those stopping along the road, such as to view wildlife at a pullout, would have longer and more frequent periods of natural quiet (see the section on natural soundscapes in this chapter). Visitors walking along boardwalks at developed areas would also have much greater opportunities for quiet and solitude. Visitors cross- country skiing or snowshoeing away from roads would have greater opportunities for quiet and solitude without traveling so far from the roadway. (Under historical conditions, visitors must travel miles from the nearest road before they escape the sound of OSV recreation). This would result in moderate beneficial impacts to visitor experience compared to historical conditions. Compared to alternative 1, there would be moderate adverse effects on opportunities for quiet and solitude because of the larger number of snowmobiles permitted under alternative 3.

Clean Air. Because this alternative requires that all snowmobiles meet BAT requirements, there would be major beneficial impacts to park air quality compared to historical conditions, especially in staging areas and along travel corridors.

Conclusion. Alternative 3 would have direct, moderate to major beneficial impacts to the experiences of park visitors compared to historical conditions. Visitors would have more opportunities to experience clean air, solitude and natural quiet in the parks. Because all snowcoach and most snowmobile riders would travel with trained guides, they would have significantly more opportunities to learn about park resources. In addition, there would be moderate beneficial impacts on safety. Disturbances to wildlife from OSVs would be reduced, which would enhance visitor opportunities to view wildlife. Compared to alternative 1, this alternative would have direct, moderate adverse impacts on visitor experience because increased vehicle numbers would affect opportunities for quiet and solitude and the quality of the groomed roads, and the presence of unguided snowmobilers would adversely affect safety.

The impacts associated with alternative 3 would not be of sufficient magnitude to constitute impairment of visitor experience.

ALTERNATIVE 4

Opportunities to View Wildlife. Most winter visitors rate wildlife viewing as a primary or important reason for visiting the parks. Under Alternative 4, visitors would continue to have outstanding opportunities to view bison, elk, trumpeter swans, and other wildlife. Wildlife viewing opportunities would be enhanced compared to historical conditions because all OSV visitors would be required to travel with commercial guides who are familiar with the movements and locations of various wildlife species.

While snowcoach and snowmobile guides routinely make impromptu stops to view wildlife, visitors may not have the ability to view wildlife for as long as they might wish, because they would be traveling on a guided tour. Visitors who wish to stop in one area for extended periods of time to view or photograph wildlife would be adversely affected by this alternative. However, this last winter however, a number commercial snowmobile guides offered essentially "private" tours of the park. They routinely put groups that consisted of 5- 7 family or friends with a guide and created a tour specific to the group's desires.

Although wildlife monitoring has shown that winter use has not had population- level impacts on any wildlife species (White et al. 2004), the effect of OSV travel on individual animals has been controversial with the public. Many park visitors have little desire to view wildlife that appears to be disturbed by human activities. Although the number of OSVs traveling through the parks under alternative 4 would be comparable to historical conditions, the presence of a guide with all OSV visitors can ensure that they do not disturb wildlife or pass animals on or near the road until it is appropriate to do so.

Opportunities to View Scenery. Snowcoach and snowmobile guides have a high degree of familiarity with the parks and would be able to direct visitors to areas of special interest, which would have a minor beneficial impact. However, the nature of the viewing experience for OSV access would change substantially. Visitors who find the personal freedom to stop and view scenery, at will, essential to their park experience would be adversely affected by this alternative, unless they were to charter a private snowcoach or snowmobile tour.

Safety. The requirement that all snowmobilers travel with commercial guides would significantly enhance visitor safety. Snowcoach and snowmobile guides are required to have first aid and CPR training, and they are usually equipped with two- way radios for emergency use. The overall effect of alternative 3 would therefore be moderate improvements in visitor safety compared to historical conditions.

Educational Opportunities. This alternative would significantly enhance the educational opportunities for visitors to learn about the parks because it requires that all OSV visitors travel with trained guides who are knowledgeable about the park's history, wildlife, thermal features, and other resources. The interaction with their guide is often one of the memorable parts of the trip for snowmobile and snowcoach riders.

Quality of the Groomed Roads. This alternative would have minor beneficial effects on the quality of the groomed roads compared to historical conditions. Compared to alternative 1, this alternative would have moderate adverse effects because of the larger number of snowmobiles permitted under alternative 4.

Quiet and Solitude. Because all snowmobiles will have to meet BAT requirements and travel with a commercial guide, visitors will have more opportunities for experiencing quiet in the parks compared to historical conditions. Visitors traveling through the park would see far fewer other parties. This would result in minor beneficial impacts for opportunities for quiet and solitude throughout the park. However, opportunities for quiet and solitude will be less than under alternatives 1, 2, and 3 because of the larger number of snowmobiles permitted under alternative 4.

Visitors stopping along the road, such as to view wildlife at a pullout, or walking along boardwalks at developed areas, such as Old Faithful or West Thumb Geyser Basin, would have infrequent opportunities for quiet and solitude. Visitors cross- country skiing or snowshoeing away from roads would have greater opportunities for quiet and solitude because of BAT and commercial guiding requirements. This would result in moderate beneficial impacts to visitor experience compared to historical conditions. Compared to alternative 1, this alternative would result in moderate adverse impacts on opportunities for quiet and solitude.

Clean Air. Because this alternative requires that all snowmobiles meet BAT requirements, there would be major beneficial impacts to park air quality compared to historical conditions, especially in staging areas and along travel corridors. Compared to alternative 1, this alternative would result in a minor to moderate decrease in opportunities to experience clean air near the West Entrance and Old Faithful.

Conclusion. Alternative 4 would have direct, moderate beneficial impacts to the experiences of park visitors compared to historical conditions. Visitors would have more opportunities to experience clean air, and slightly more opportunities to experience solitude and natural quiet. Because all OSV visitors would be led by commercial guides, they would have more opportunities to learn about park resources. In addition, there would be improvements to safety. Disturbances to wildlife from OSVs would be somewhat reduced, which would enhance visitor opportunities to view wildlife. Compared to alternative 1, this alternative would have direct, moderate adverse impacts on visitor experience because increased vehicle numbers would affect opportunities for quiet and solitude and the quality of the groomed roads.

The impacts associated with alternative 4 would not be of sufficient magnitude to constitute impairment of visitor experience.

ALTERNATIVE 5

Opportunities to View Wildlife. Most winter visitors rate wildlife viewing as a primary or important reason for visiting the parks. Under Alternative 5, visitors would continue to have outstanding opportunities to view bison, elk, trumpeter swans, and other wildlife. Wildlife viewing opportunities would be enhanced compared to historical conditions because approximately 80% of snowmobilers would be required to travel with commercial guides who are familiar with the movements and locations of various wildlife species.

This alternative would allow approximately 20% of snowmobilers to travel in YNP accompanied by non- commercial guides. While these visitors would enjoy the opportunity to travel throughout the park at their own leisure, they would not have the added benefit of a commercial guide. This may result in fewer opportunities to view wildlife for these visitors.

Although wildlife monitoring has shown that winter use has not had population- level impacts on any wildlife species (White et al. 2004), the effect of OSV travel on individual animals has been controversial with the public. Many park visitors have little desire to view wildlife that appears to be disturbed by human activities. The number of OSVs traveling through the parks under alternative 5 could be higher than historical conditions, which would result in more situations where wildlife are disturbed or harassed by them. In addition, most snowmobile visitors would be led by a commercial guide who can ensure that they do not disturb wildlife or pass animals on or near the road until it is appropriate to do so. However, some snowmobilers would travel with non- commercial guides, who would not be as well trained as commercial guides, and this could result in more disturbances to wildlife than in alternatives 1 to 4.

Opportunities to View Scenery. Snowcoach and snowmobile guides' familiarity with the parks enables them to direct visitors to areas of special interest, which would have a minor beneficial impact. However, the viewing experience for OSV access would change substantially. Some visitors who wish to travel at their own pace would be allowed to do so, as this alternative allows approximately 20% of snowmobile entries to be non- commercially guided.

Safety. The general increase in vehicle miles traveled under alternative 5 would increase the likelihood of OSV accidents compared to historical conditions. However, this would be offset by the requirement that most snowmobilers travel with commercial guides. Snowcoach and snowmobile guides are usually equipped with two- way radios for emergency use and are required to have first aid and CPR training. This alternative also allows approximately 20% of visitors to travel with non- commercial guides, who would not be as well prepared or trained as commercial guides and could adversely affect their own and other visitors' safety. The overall effect of alternative 3 would therefore be moderate improvements in visitor safety compared to historical conditions. Compared to alternative 1, there would be moderate adverse effects to safety because of the presence of non- commercially guided snowmobiles and the higher number of OSVs.

Educational Opportunities. This alternative would significantly enhance the educational opportunities for visitors to learn about the parks because it requires that 80% of all OSV visitors travel with commercial guides who are knowledgeable about the park's history, wildlife, thermal features, and other resources. The interaction with their guide is often one of the memorable parts of the trip for snowmobile and snowcoach riders. For snowmobilers traveling without commercial guides, there would be no change in educational opportunities compared to historical conditions. Compared to alternative 1, there would be minor adverse effects in educational opportunities because some snowmobilers would be traveling without commercial guides.

Quality of the Groomed Roads. This alternative would adversely affect the quality of groomed oversnow roads because the total number of OSVs would be nearly 25% higher than the historical average of 765 snowmobiles per day. Poor road conditions would be exacerbated on warm days with poor snow cover, when there could be moderate to major adverse effects on the quality of the groomed road surface.

Quiet and Solitude. Because all snowmobiles will have to meet BAT requirements and 80% will be required to travel with a commercial guide, visitors may have more opportunities for quiet and solitude in some park locations compared to historical conditions. However, this alternative allows approximately 25% more snowmobiles than historical conditions, which would offset these gains. Visitors traveling throughout the park would see other parties more

often, which would adversely affect their sense of solitude. Visitors stopping along the road, such as to view wildlife at a pullout, or walking along boardwalks at developed areas, such as Old Faithful or West Thumb Geyser Basin, would rarely have opportunities for quiet and solitude. Visitors cross- country skiing or snowshoeing away from roads would have greater opportunities for quiet and solitude because of BAT and commercial guiding requirements. This would result in moderate beneficial impacts to visitor experience compared to historical conditions. Compared to alternative 1, this alternative would result in major adverse impacts on opportunities for quiet and solitude because of the larger number of snowmobiles permitted under alternative 5.

Clean Air. Because this alternative requires that all snowmobiles meet BAT requirements, there would be moderate beneficial impacts to park air quality compared to historical conditions, especially in staging areas and along travel corridors. Compared to alternative 1, this alternative would result in a minor to moderate decrease in opportunities to experience clean air near the West Entrance and Old Faithful.

Conclusion. Alternative 5 would have direct, moderate beneficial impacts to the experiences of park visitors compared to historical conditions. Because all snowcoach riders and most snowmobilers would travel with commercial guides, they would have significantly more opportunities to learn about park resources. In addition, there would be improvements to safety. Disturbances to wildlife from OSVs would increase because of the higher number of vehicles and the presence of self- guided snowmobiles, which could This could have minor adverse effects on visitors' opportunities to view wildlife. Compared to alternative 1, this alternative would have major adverse impacts on visitor experience because increased snowmobile numbers would affect opportunities for quiet and solitude and the quality of the groomed roads, and the presence of self- guided snowmobiles would adversely affect safety and wildlife.

The impacts associated with alternative 5 would not be of sufficient magnitude to constitute impairment of visitor experience.

THE EFFECTS OF IMPLEMENTING THE ALTERNATIVES ON BISON AND ELK

METHODS

The following analyses of potential adverse effects to wildlife are limited to various alternatives for OSV recreation in the parks and groomed roads and trails for OSV use. The analyses are further limited to those wildlife species (i.e., bison and elk) for which new information and analysis may alter the assessment of impacts as disclosed in the Final EIS and the Final SEIS, and for which impacts may vary by alternative. The analyses of impacts to other species provided the Final EIS (pages 237- 262) remain valid. The analyses comply with NPS regulations and policies for management of wildlife, including the legislation and Executive Orders that were summarized in the Final EIS, Appendix C.

The following sources of information were used to assess the levels of impact on wildlife:

- Scientific literature on species' life histories, distributions, habitat selection, and responses to human activities.
- Site- specific information on wildlife species in the parks, including information from completed and on- going studies, and the professional judgment of biologists familiar with the management concerns related to individual species. Park- specific information and scientific literature documented in the Final EIS (pages 143- 158 and 237- 262) is incorporated in this EA by reference. Alternative 1a in the SEIS contains a review of pertinent information that became available after the Final EIS was completed.
- A risk assessment, categorized by road segment, of adverse effects to bison and elk from OSVs.

Effects are characterized according to their intensity and scale of impact on individual wild animals and wildlife populations using criteria that differentiate between levels of effects based on their degree of measurability or detectability (Table 44). Variations in alternatives that mitigate the impacts of these actions are included and reflected in the statements of effects.

Table 44. Definition of impacts to wildlife.

Impact Category	Definition
No Effect	An action that does not affect a species.
No Known Effect	An action that may affect a species elsewhere, but for which there are no demonstrated impacts known to occur in the parks.
Adverse Negligible Effect	An action that may affect a population or individuals of a species, but the effect would be so small that it would not be of any measurable or perceptible consequence to the population.
Adverse Minor Effect	An action that may affect a population or individuals of a species, but the effect would be small; if it is measurable, it would be a small and localized consequence to the population.
Adverse Moderate Effect	An action that will affect a population or individuals of a species; the effect may be measurable and may have a sufficient consequence to the population but is more localized.
Adverse Major Effect	An action that will noticeably affect a population or individuals of a species; the effect will be measurable and have a substantial and possible permanent consequence to the population.

MANAGEMENT OBJECTIVES

Each alternative will be assessed based on the extent to which it meets the following list of objectives The following list of objectives, which is focused on the effects of OSVs on bison and elk and was developed specifically for this EA:

- Minimize vehicle- caused wildlife injuries and deaths by maintaining or reducing the 10- year average of 1.6 large mammals struck per winter (Gunther et al. 1999: data from 1989- 1998);
- Minimize human conflicts with bison and elk movements in association with groomed roads by minimizing the levels of their "active" responses. Visible reactions are divided into two general categories for the purpose of this analysis. Any relatively energetically expensive response is considered "active." This includes movement away from a disturbance (run, flight), defensive reactions (charge), and disturbance- caused behavior that reduces foraging

opportunities. Studies have variously defined this type of wildlife behavior as "negative," "agitation," etc. Conversely, reactions by wildlife that cost relatively less energy are not considered "active" responses. This includes no visible response or a look- and- resume response in which an animal reacts to the disturbance but immediately returns to normal activities;
- Minimize the facilitation of ungulate use of groomed roads;
- Minimize the avoidance, displacement, and harassment of wildlife from noise, vehicles, and other human activities; and
- Ensure no detectable adverse or negative population- level effects.

IMPACTS COMMON TO ALL ALTERNATIVES

General Comments and Assumptions

Winter recreation activities take place when ungulates are experiencing prolonged under-nutrition and catabolizing body protein due to lower availability and quality of forages and increased energetic costs from deep snows and colder ambient temperatures. Disturbance or harassment of wildlife during this sensitive time can have a negative effect on individual animals and, in some cases, populations as a whole (Anderson 1995, Moen et al. 1982). Wildlife responses to winter recreation are also context- dependent because random weather events (e.g., severe snows, cold temperatures, etc.) during winter in mid- to high- elevation mountain environments interact with animal density to strongly influence population dynamics and how individual animals move and distribute themselves across the landscape.

There will always be uncertainty regarding the effects of winter recreation on wildlife in the parks because of the complex interactions of the disparate variables involved. Thus, managers will inevitably need to act without the luxury of complete knowledge, using the best available information to evaluate the range of possible effects, and weigh the potential benefits and costs of alternate management actions against the risks of inaction.

By chance, data on wildlife responses to winter recreation in YNP has been gathered over a series of relatively mild to moderate winters (1998- 2004). Thus, it is not known if increased energetic requirements during a severe winter would alter the frequency and magnitude of wildlife responses to winter recreation, or result in significant, measurable effects. However, throughout the analyses in this EA, we have made the assumption that any effects of OSVs and winter recreation would be exacerbated during severe winters owing to increased energetic costs and chronic, severe under- nutrition.

OSV activities may cause a wide range of responses from wildlife with repercussions at differing scales. For example, collisions between OSVs and wildlife can cause direct mortality, while single or repeated interactions between OSVs and wildlife could lead to relatively high energy expenditures from flight reactions. Animals can be displaced from important habitats by human activity, or they can experience less obvious effects like elevated heart rate and metabolism which, in turn, can result in high energy expenditures (Canfield et al. 1999), elevated production of stress hormones (i.e., glucocorticoids), increased susceptibility to predation, decreased reproduction, and diminished condition (Geist 1978, Aune 1981, Moen et al. 1982, Cassier et al. 1992, Picton 1999, Hardy et al. 2001, Creel et al. 2002). An implicit assumption in this EA is that increasing OSV traffic will likely result in increasing responses by, or stress to, wintering wildlife (Hardy 2001, Creel et al. 2002). Existing data generally support this assumption, though precise

quantification of this relationship in the parks is not yet possible because some wildlife apparently habituate to OSV recreation, thereby mitigating these odds in some situations.

A second assumption in this EA is that the likelihood of bison or elk actively responding to snowmobiles or snowcoaches increases as the number of vehicles in a group increases. Borkowski (2004) reported that each additional snowmobile in a group (up to 12) increased the odds of an active response in bison by an estimated 14%, as opposed to no response. Thus, under identical conditions, the expected odds of an active bison response were, on average, 28% higher for a group of four snowmobiles than for a group of two snowmobiles. Likewise, each additional snowmobile in a group (up to 12 snowmobiles only) increases the odds of an active response in elk by 4.4 times. These findings also suggest that when multiple snowcoaches are present at an interaction with ungulates, they might elicit a higher level of behavioral response than a single snowcoach.

A third assumption in this EA is that the likelihood of bison or elk actively responding to OSVs is higher for snowcoaches than for snowmobiles. Snowcoaches are larger than snowmobiles and Borkowski (2004) found that the odds of bison or elk actively responding to OSVs was approximately 2 and 18 times greater, respectively, if a snowcoach was present. This finding also suggests that when multiple snowcoaches are present at an interaction with ungulates, they might elicit a higher level of behavioral response than snowmobiles. Allowing access only by snowcoaches will not prevent active responses from bison and elk, however, existing data does not enable us to precisely quantify or directly compare the relative effects to bison and elk of increasing levels of snowcoach use while decreasing snowmobile use to maintain historic levels of visitation (i.e., alternatives 1- 3).

Habituation has been defined as a waning of behavioral response to a repeated stimulus (Whittaker and Knight 1998). Eibl- Eibesfeldt (1970) noted that this waning could include physiological responses. Habituation may occur when animals learn that the stimulus is not threatening, or flight or displacement is not possible (e.g., in critical or limited winter range, during severe winters when the snowpack is deep, or when the weakened physical state of the animal precludes it). In YNP, several studies have suggested bison and elk habituate to winter recreation activities to some extent, but some animals still respond to closer- proximity interactions and/or unpredictable disturbances (Aune 1981, Hardy 2001, Davis et al. 2004, White et al. 2004). Studies have found evidence of habituation on daily and seasonal time scales in elk, bison, and white- tailed deer (Richens and Lavigne 1978, Hardy 2001, Davis et al. 2004, White et al. 2004), and suggest that regular, predictable activity patterns by recreationists may reduce the potential for adverse effects to wildlife.

Vehicle- related Mortality

The annual number of ungulate deaths caused by OSVs from 1989- 1999 was estimated as <1% of each species' total abundance in YNP (Gunther et al. 1999, and the Final EIS, pages 239- 241). To date, there is no report of snowcoach- wildlife collisions, suggesting that current snowcoach technology and operation is less likely to result in such collisions. In addition, the number of snowcoaches entering the park is expected to be less than that of snowmobiles. Despite the small number of road- killed ungulates compared to the size of their populations, the NPS is concerned about impacts to individual animals and seeks to minimize collisions caused by motorized vehicles of all kinds. Alternatives that increase OVS traffic in wildlife winter range (where most collisions occur) would likely increase the frequency of road- killed wildlife (Gunther et al. 1999).

Disturbance Responses

Repeated flight reactions or reduced foraging opportunities can lead to higher energy expenditures which, in turn, can result in decreased survival and reproduction. Robinson and Gehman (2002) filmed human- wildlife interactions in the southwestern portion of YNP from December 21, 2001, to March 5, 2002. Two people conducted surveys during a period of (including 104 observation sessions on 46 of the days) that resulted in 83 hours and 52 minutes of observation time). The observation and monitoring time was representative of the wildlife use and species on or near the road, with 88% bison, 9% elk, and 3% coyote observations. Robinson and Gehman recorded a total of 88 negative interactions during this time period. A negative interaction was defined as a human activity resulting in a significant disruption of animal behavior. Types of wildlife responses to negative interactions were: 1) running away; 2) jumping over the snow berm on the side of the road or otherwise moving from the road surface into adjacent deep snow; 3) stopping feeding activities; or 4) becoming agitated or alarmed. Of the 88 negative interactions, 63 (70%) involved snowmobiles, 27 (30%) involved snowcoaches, and two involved people on foot who had been riding snowmobiles. The rate of negative interactions was one for every 61 minutes of observation at the site being recorded. Robinson and Gehman extrapolated from this data to estimate that 622 negative human- wildlife interactions occurred in their study area during that winter season. The human behaviors observed during the negative interactions included: 1) inappropriate passing resulting in frightening, chasing, or herding animals; 2) stopping less than 25 meters from animals; 3) throwing snowballs at animals; 4) blocking the road so that the movement of bison was halted; and 5) an individual attempting to stroke or pet a bison from a passing snowmobile.

Jaffe et al. (2002) classified 34% of wildlife responses to OSVs as either "moderate" (29%) or "agitation" (5%). Davis et al. (2004) and White et al. (2004) documented 16% and 24% active responses in 2003 and 2004, respectively. The 2003 and 2004 data also show that 80% and 79% of documented active responses by bison and elk were caused by snowmobiles, and approximately 20% by snowcoaches, which were 6% and 17% of the observed interactions for those years.

Energetic Costs and Stress

Detailed energetics models to evaluate the relative energy costs of interactions with OSVs for wildlife compared to their total daily energy expenditures require numerous assumptions and parameter estimates that are not well defined, but could strongly influence model output (Beissinger and Westphal 1998). Several independent studies of the responses of wildlife to OSVs and associated humans in YNP (Hardy 2001, Jaffe et al. 2002, Davis et al. 2004) have consistently reported that behavioral responses were relatively infrequent, short in duration, and of minor to moderate intensity. This suggests that animals exposed to OSVs typically do not incur a substantial energetic cost from such interactions, even if provocations are repeated throughout the day. Similar findings were reported for wild reindeer (*Rangifer tarandus*) in southern Norway responding to direct provocation by snowmobiles or skiers (Reimers et al. 2003). However, based on different assumptions, Picton (1999) estimated higher costs for elk in some situations. Minor energetic costs of human disturbance would especially be expected if animals habituate to OSVs, as appears to be the case for bison and elk in the most intensively used OSV corridors in YNP.

To provide a physiological index of stress, which could contribute to increased energy costs (Mayes 1976, Sapolsky 1992), some studies have measured fecal glucocorticoid (FGC) levels in

wildlife exposed to OSV recreation. While there are currently no data to differentially compare FGC stress hormone levels produced by animals exposed to snowmobiles or snowcoaches, an implicit assumption in this EA is that increasing levels of OSV traffic will likely result in increasing responses by, or stress to, wintering wildlife (Hardy 2001, Creel et al. 2002).

Hardy (2001) reported that fecal glucocorticoid (FGC) levels in adult female elk increased as daily numbers of vehicles increased and as traffic entering the West Yellowstone gate exceeded 7,500 cumulative vehicles during 1999 and 2000 (Hardy 2001, Creel et al. 2002). FGC levels were higher in elk that wintered along the busiest oversnow road in the park (West Yellowstone to Old Faithful) than along less frequented roads (Hardy 2001). Despite these apparent stress-related responses, there was no evidence that snowmobile activity during the winters of 1999 and 2000 affected the population dynamics of elk (Hardy 2001, Creel et al. 2002).

Animals may exhibit physiological and behavioral responses to human- caused noise. For a literature review of the effects of noise on wildlife see the Final EIS (page 222). An analysis of these effects is implicit in the assessment of OSV use for each alternative. It can be inferred that as the level, location, and type of OSV use changes, so will the associated effects of OSV sound. For an analysis of how the natural soundscape is affected by each alternative, see Chapter IV.

Displacement

Human activities that result in displacement of animals from parts of their home range may be considered a form of habitat fragmentation. In particular, increased human access into elk winter range by groomed roads may reduce the overall scale and effectiveness of elk habitat, and lead to increased harassment and energetic stress (Picton 1999). Aune (1981) noted that wildlife was displaced within 60 meters from trails and roads, and that their movements were inhibited by traffic and the snow berms created by plowing and grooming operations. He also reported that wildlife developed crepuscular patterns in response to winter recreation in the Madison, Firehole, and Gibbon River valleys. Hardy (2001) reported that elk in the same area may have been displaced from suitable habitat along the busiest winter road in the park (West Yellowstone to Old Faithful) partly by heavy OSV traffic. However, Hardy also stated that "[d]espite varying responses to increasing winter visitation since the late 1970s, bison and elk winter in the same area each year." Thus, displacement was relatively localized and did not translate to large- scale patterns of habitat avoidance. However, in the context of a severe winter, Dorrance et al. (1975) and Aune (1981) point out that even short- term habitat displacement can be detrimental to wildlife survival.

Population- level Impacts

The abundance of Yellowstone bison has increased during the period of increasing winter use, indicating that the population is not experiencing significantly lower recruitment or higher winter mortality because of OSV recreation (Hardy 2001, White et al. 2004). Likewise, the non-migratory elk herd in the Madison- Gibbon- Firehole drainages of Yellowstone has remained in dynamic equilibrium for the past 30 years despite being exposed to the highest levels of OSV traffic in the park (Hardy 2001, Jaffe 2001, Bjornlie and Garrott 2001).

Road Grooming

The effects of road grooming on bison demography and distribution is a contentious issue with substantial disagreement among biologists (Meagher 1989, 1998; Bjornlie and Garrott 2001).

Some biologists maintain that ungulates benefit from road grooming activities associated with winter recreation by using the groomed road surfaces as energy- efficient travel corridors. Meagher (1998) and Taper et al. (2000) noted that road use by bison was important during stress- induced, exploratory dispersal, and that without an intended destination, exploratory travel is likely to occur on the energy- efficient, plowed or snow- packed roads. Meagher (1989) also maintained that groomed routes have facilitated bison range expansion in Yellowstone. If presented with a choice, bison generally prefer to maintain a relatively high level of social aggregation (Meagher 1998). Over time, more bison have exited the park in an apparent effort to maintain social relationships. In doing so, bison have come into conflict with different land- use objectives outside the park, and some have been removed from the population under state legal authority (Meagher et al. 2002).

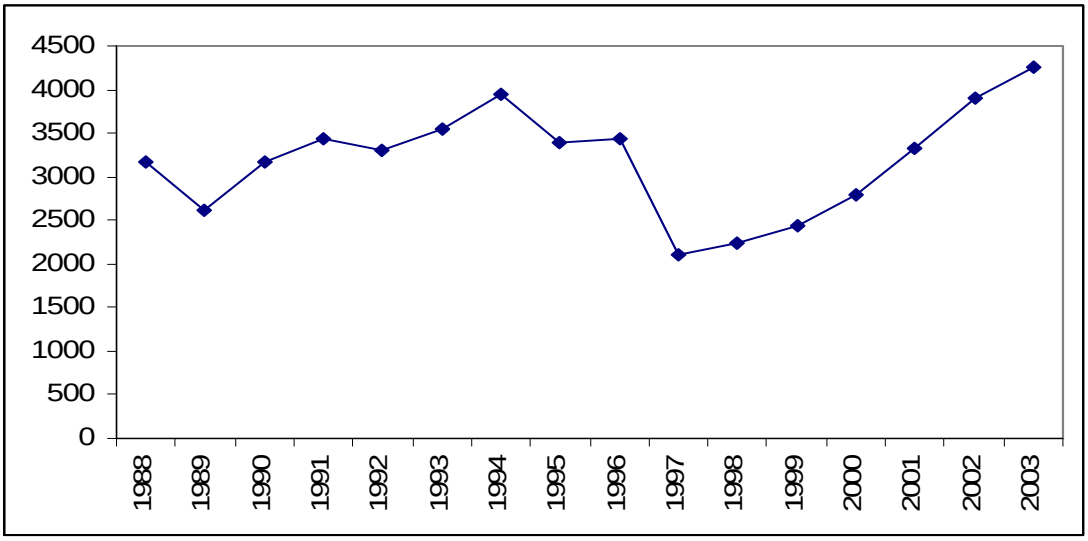

Figure 8. Trend in counts of Yellowstone bison, 1988- 2003, Yellowstone National Park (White et al. 2004).

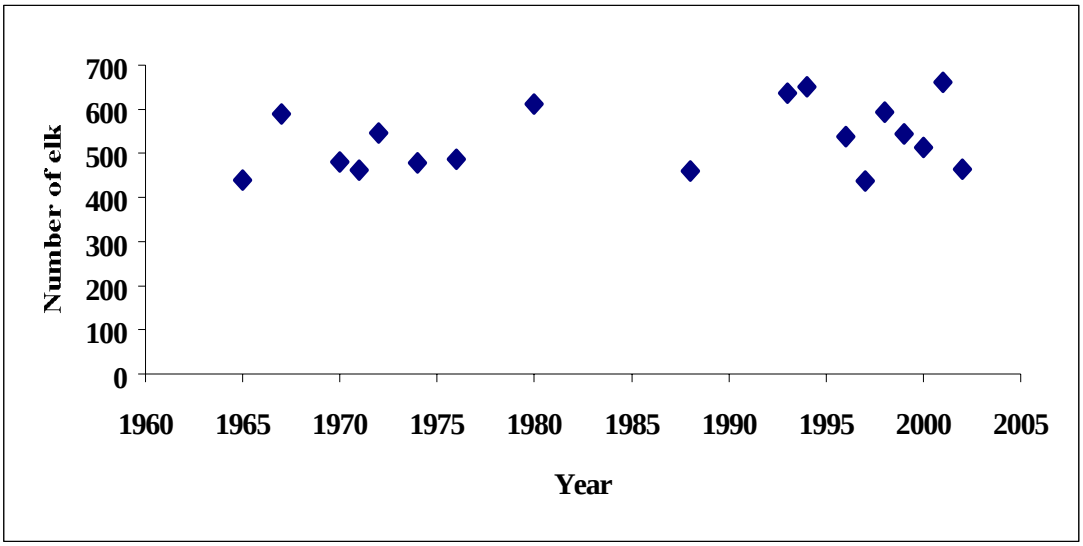

Figure 9. Estimates of abundance for central Yellowstone elk, 1965- 2003, Yellowstone National Park (White et al. 2004).

In contrast, Bjornlie and Garrott (2001) reported that most bison winter travel occurred off roads, along geothermal features, social trails, and river and stream banks. Other studies of bison in Yellowstone during winter have generally supported this contention (e.g., Reinertson et al. 2001, Bjornlie and Garrott 2001, Davis et al. 2004, White et al. 2004). Bjornlie and Garrott (2001) also reported that bison use of roads was negatively correlated with grooming, with peak use occurring in April when roads were not being groomed and lowest use occurring when roads were groomed. Thus, they concluded that "grooming roads during winter does not have a major influence on bison ecology" (Bjornlie and Garrott 2001).

Though the road grooming issue is important for assessing the effects of OSV use on ungulates, it is not addressed in this EA because a series of ongoing investigations and analyses focused on that topic have yet to be completed. These studies are listed in Chapter 3, Affected Environment, Additional Topics Dismissed in the EA.

Mitigation Measures Common to All Alternatives

As detailed in Appendix A, "Mitigation Measures Common to All Alternatives," training snowcoach drivers and/or snowmobile guides to anticipate wildlife locations and behavior, and increasing their awareness about the risks of winter driving in the parks, could reduce vehicle-caused mortality. These relatively few guides could then supervise the speed and control at which most snowmobilers travel in the parks. Training snowcoach drivers and/or snowmobile guides how to minimize impacts on wildlife in the presence of wildlife by remaining an appropriate distance and reducing the noise level of their group and their time per interaction could reduce disturbance responses and displacement. Night driving restrictions could reduce vehicle- caused mortality by limiting travel during low- visibility hours. At certain times of the year, late- evening and early- morning driving restrictions could reduce displacement during foraging hours.

Borkowski's analysis of 2003 and 2004 data show that, during interactions with wildlife, increasing group size increases the odds of active responses (see discussion above). Therefore, group size restrictions that result in smaller groups are expected to decrease disturbance responses.

ALTERNATIVE 1

This alternative would limit public oversnow access to snowcoaches, with up to 146 snowcoaches operating in YNP each day.

Vehicle- related Mortality. The objective of maintaining or reducing the 10- year average of large animals struck by OSVs is expected to be accomplished under alternative 1 because overall traffic volume would decrease and snowcoaches have not contributed to any known deaths of bison or elk. Training snowcoach drivers in safe vehicle operation and prohibiting OSV use from 9 P.M. to 7 A.M. could reduce OSV- related wildlife collisions and mortality. Thus, vehicle collision impacts to bison and elk are predicted to be adverse but negligible under Alternative 1.

Disturbance and Physiological Responses. The objective of minimizing active wildlife response is expected to be accomplished by Alternative 1 due to lower overall traffic volumes and, hence, lower wildlife–OSV interaction rates than previous winters. Lower interaction rates may translate into relatively fewer disturbances and less physiological stress to individual bison and elk. However, snowcoaches are larger than snowmobiles and Borkowski (2004) found that the odds of bison or elk actively responding to OSVs was approximately 2 and 18 times greater, respectively, if a snowcoach was present. This finding also suggests that when multiple snowcoaches are present at an interaction with ungulates, they might elicit a higher level of behavioral response than snowmobiles. Allowing access only by snowcoaches will not prevent active responses from individual bison and elk, however, existing data does not enable a precise quantification or direct comparison with the relative effects to bison and elk of increasing levels of snowcoach use while eliminating snowmobile use to maintain historic levels of visitation. Training snowcoach drivers in appropriate behavior in the presence of wintering wildlife and prohibiting snowcoach use from 9 P.M. to 7 A.M. could reduce traffic- related effects. Thus, disturbance and energetic/stress impacts to bison and elk are predicted to be adverse and minor to moderate.

Displacement. The objective to minimize the avoidance, displacement, or harassment of wildlife from human disturbance is expected to be accomplished under Alternative 1. The lower traffic volume under Alternative 1 is predicted to reduce interactions from historic levels. However, existing data suggest that the much larger snowcoaches may elicit a higher level of behavioral response from bison and elk than snowmobiles. Training snowcoach drivers in appropriate behavior in the presence of wintering wildlife and prohibiting snowcoach use from 9 p.m. to 7 a.m. could reduce traffic- related effects. Overall, displacement impacts are predicted to be adverse and minor to moderate under alternative 1.

Population- level Impacts. The objective of ensuring no detectable, negative effects on population dynamics is expected to be accomplished by alternative 1. No negative population-level impacts have been detected under higher levels of winter use, so decreased levels of use under alternative 1 should minimize disturbance to wildlife. Thus, population- level impacts are predicted to be none to adverse and negligible under Alternative 1.

Conclusion. Impacts on bison and elk from alternative 1 vary from none to adverse and moderate. The total number of OSVs allowed into the park would substantially decrease and, because all visitors would be traveling in guided vehicles, OSV users would be less likely to interact with wildlife and cause mortalities. However, existing data suggest that the much larger snowcoaches may elicit a higher level of behavioral response from bison and elk than snowmobiles. Compared to historical conditions, alternative 1 would have beneficial impacts upon facets of wildlife- OSV interactions, because the total number of OSVs allowed into the park would dramatically decline and because all visitors would be traveling in guided groups. The impacts associated with alternative 1 would not be of sufficient magnitude to constitute impairment of elk and bison populations.

ALTERNATIVE 2

In addition to 87 snowcoaches in YNP each day, this alternative would allow 318 snowmobiles in YNP and 50 in GTNP. All the snowmobiles entering YNP would have to be commercially guided.

Vehicle- caused Mortality. The objective of maintaining or reducing the 10- year average of large animals struck by OSVs is expected to be accomplished by Alternative 2. The risk of vehicle- caused mortality can be mitigated by speed limits, guiding requirements, and night-driving restrictions. The likelihood of vehicle impacts would be higher then under alternative 1 because of the presence of snowmobiles. The number of snowmobiles allowed under alternative 2 approximates the number present in the 2003- 2004 winter season, during which there were no OSV- related mortalities. Given that alternatives 3, 4 and 5 allow more snowmobiles, they are all expected to have higher risks of vehicle strikes than does alternative 2. Thus, vehicle collision impacts to bison and elk are predicted to be adverse but negligible under alternative 2.

Disturbance and Physiological Responses. The objective of minimizing active responses by bison and elk is expected to be accomplished by alternative 2 because of the lower number of snowmobiles compared to historic conditions and lower wildlife–OSV interaction rates. Under alternative 2, lower traffic volumes may also cause less physiological stress to individual bison and elk. However, existing data suggest that the much larger snowcoaches may elicit a higher level of behavioral response from bison and elk than snowmobiles.

Under alternative 2, commercial guides would lead all snowmobile groups in YNP. Using guides that have training and experience riding with winter wildlife, and a professional obligation to obey NPS regulations, are the most efficient means to educate riders and ensure compliance with park rules. Authorized guide companies, each responsible for the activities of their tour groups, can reduce impacts by: keeping their groups an appropriate distance from wildlife, preventing riders from approaching animals, and reducing noise levels and the time a group remains interacting with a group of animals, etc. Professional guide services with contractual obligations also permit more effective enforcement by NPS rangers and business management personnel. During interviews, Taylor and Cole (2003) found that recreationists often believed that it was acceptable to approach wildlife more closely than the data indicated animals would tolerate. Thus, the education and supervision provided to groups by their commercial guides is predicted to decrease disturbance responses by wildlife.

The average number of snowmobiles entering YNP during the 2003- 2004 season was 254 per day, which is 20% less than the number allowed under alternative 2. Monitoring that winter

indicated that active responses by bison and elk comprised 344 of the total 1,654 (21%) observed responses by those species (White et al. 2004). If active responses vary in a predictable manner with snowmobile numbers, then the level of active response observed in the preceding season should be maintained. Thus, disturbance and energetic/stress impacts to bison and elk are predicted to be adverse, and minor to moderate.

Displacement. The objective to minimize the avoidance, displacement, or harassment of wildlife from human disturbance is expected to be accomplished by alternative 2. The relatively low traffic volume is expected to reduce interactions from historic conditions. Higher levels of use have resulted in negligible to minor impacts to bison and elk. Training snowcoach drivers and snowmobile guides in appropriate behavior in the presence of wintering wildlife and prohibiting OSV use from 9 p.m. to 7 a.m. could reduce traffic- related effects. Thus, displacement impacts to individual bison and elk under alternative 2 are predicted to be adverse and minor to moderate.

Population- level Impacts. The objective of ensuring no detectable, negative effects on population dynamics is expected to be accomplished by alternative 2. No negative population-level impacts have been detected under higher levels of winter use. Thus, the population- level impacts to bison and elk under alternative 2 are predicted to be none to negligible.

Conclusion. Impacts on bison and elk from alternative 2 vary from none to adverse and moderate. The total number of OSVs allowed into the park would substantially decrease and, because all visitors would be traveling in guided vehicles, OSV users would be less likely to interact with wildlife and cause mortalities. However, existing data suggest that the much larger snowcoaches may elicit a higher level of behavioral response from bison and elk than snowmobiles. Compared to historical conditions, this alternative would have beneficial impacts upon all facets of wildlife- OSV interactions because the total number of OSVs allowed in the parks would dramatically decline and all visitors would be traveling in guided groups. Under such conditions, OSV users would be less likely to interact with wildlife, causing fewer mortalities, less stress, less displacement, and fewer population- level impacts. The impacts associated with alternative 2 would not be of sufficient magnitude to constitute impairment of elk and bison populations.

ALTERNATIVE 3

In addition to 45 snowcoaches in YNP per day, this alternative would allow 540 snowmobiles in YNP and 75 in GTNP. Eighty- two percent of YNP snowmobiles would be have to be commercially guided.

Vehicle- Caused Mortality. The objective of maintaining or reducing the 10- year average of large animals struck by OSVs is expected to be accomplished by alternative 3. All documented incidents of OSV- wildlife collisions have involved snowmobiles. Because alternative 3 allows more snowmobiles than alternatives 1 and 2, the likelihood of vehicle impacts would increase. However, this risk can be mitigated by speed limits, guiding requirements, and night- driving restrictions. In the 10- year period that road- kill data was collected, snowmobile numbers were higher than allowed under alternative 3, so vehicle- caused mortality is not predicted to rise above that average. Consequently, this alternative is predicted to have negligible adverse effects on wildlife mortality.

Disturbance and Physiological Responses. Lower traffic volumes and hence lower wildlife–OSV interaction rates compared to historic conditions may reduce active responses and result in less physiological stress to individual bison and elk. The average number of snowmobiles entering YNP during the 2002- 2003 season was 656 per day, 21% more than the number allowed under alternative 3. Monitoring during that winter indicated that active responses by bison and elk comprised 158 (15%) of the total 1,301 observed responses by those species (Davis et al. 2004). If response levels vary predictably with OSV numbers, then the level of active response by bison and elk should not increase substantially under alternative 3. However, existing data suggest that the much larger snowcoaches may elicit a higher level of behavioral response from bison and elk than snowmobiles. Existing data does not enable us to precisely quantify or directly compare the relative effects to bison and elk of increasing levels of snowcoach use while decreasing snowmobile use to maintain historic levels of visitation.

This alternative allows for approximately 20% unguided snowmobiles. Although the limited data does not allow a projection based solely on the presence of unguided riders, many of the mitigation proposals detailed in Appendix C are predicated on the ability of the NPS to train snowmobile operators. Education is extremely important. During interviews, Taylor and Cole (2003) found that recreationists often believed that it was acceptable to approach wildlife more closely than the data indicated animals would tolerate. Aside from day- to- day enforcement and ongoing interpretive efforts, this alternative does not include specific methods for ensuring that snowmobilers behave appropriately in the presence of wintering wildlife. Based on law enforcement statistics, unguided riders are expected to travel at higher speeds and approach animals more frequently than guided riders do, which is expected to increase traffic- related impacts. A benefit of unguided groups is that, according to visitor surveys, unguided groups tend to be smaller than guided groups. In interactions in which riders do not approach wildlife, smaller group sizes reduce disturbance impacts. The effects could further be mitigated by prohibiting OSV use from 9 P.M. to 7 A.M.

Overall, alternative 3 is expected to result in similar disturbance and stress to individual bison and elk as predicted for alternatives 1 or 2. The entry time requirements for alternative 3 would contribute to a more predictable morning traffic pattern, which could promote habituation (Whittaker and Knight 1998). Additional mitigation efforts for unguided groups could include mandatory training on how to minimize impacts in the presence of wildlife by remaining an appropriate distance and reducing the noise level of their group and time per interaction could reduce disturbance responses and displacement. Disturbance and energetic/stress impacts to individual bison and elk under alternative 3 are predicted to be adverse and minor to moderate.

Displacement. The objective to minimize the avoidance, displacement, or harassment of wildlife from human disturbance is expected to be accomplished by alternative 3. Levels of unregulated use higher than alternative 3 have resulted in minor to moderate impacts to bison and elk, so implementation of alternative 3 should not increase effects. The guided snowmobile component in alternative 3 would reduce impacts caused by unguided riders. Displacement impacts to individual bison and elk under alternative 3 are predicted to be adverse and minor to moderate.

Population- Level Impacts. The objective of ensuring no detectable, negative effects on population dynamics is expected to be accomplished by alternative 3. No negative population-level impacts have been detected under higher levels of OSV use, so decreased levels of use

under alternative 3 should minimize disturbance to bison and elk. Population- level impacts to bison and elk under alternative 3 are predicted to be none to negligible.

Conclusion. Impacts on bison and elk from alternative 3 vary from none to adverse and moderate. The total number of OSVs allowed into the park would decrease and, because most visitors would be traveling in guided vehicles, OSV users would be less likely to interact with wildlife and cause mortalities. However, existing data suggest that the much larger snowcoaches may elicit a higher level of behavioral response from bison and elk than snowmobiles. Compared to historical conditions, this alternative would have beneficial impacts upon all facets of wildlife- OSV interactions because the total number of OSVs in the parks would decline and because most visitors would be traveling in guided groups. Under such conditions, OSV users would be less likely to interact with wildlife, causing fewer mortalities, less stress, less displacement, and fewer population- level impacts. The impacts associated with alternative 3 would not be of sufficient magnitude to constitute impairment of elk and bison populations.

ALTERNATIVE 4

In addition to 18 snowcoaches in YNP per day, this alternative would allow 720 snowmobiles in YNP and 140 in GTNP. All OSV users in YNP would have to be commercially guided.

Vehicle- related Mortality. The objective of maintaining or reducing the 10- year average of large animals struck by OSVs is expected to be accomplished by alternative 4. All documented incidents of OSV- wildlife collisions have involved snowmobiles. Because alternative 4 allows more snowmobiles than alternatives 1, 2, and 3, the likelihood of vehicle impacts would increase. However, this risk can be mitigated by speed limits, guiding requirements, and night- driving restrictions. In the 10- year period that road- kill data was collected, snowmobile numbers were slightly higher than allowed under alternative 4, so vehicle- caused mortality is not predicted to rise above that average. Thus, vehicle collision impacts to bison and elk under alternative 4 are predicted to be adverse but negligible.

Disturbance and Physiological Responses. The objective of minimizing levels of active response is not expected to be accomplished by alternative 4. The relatively higher traffic volumes and hence higher wildlife–OSV interaction rates under alternative 4 may result in a higher number of active responses and more physiological stress to individual bison and elk than under alternatives 1- 3. However, commercial guides would lead all snowmobile groups in YNP. Using guides that have training and experience riding with winter wildlife, and a professional obligation to obey NPS regulations, are the most efficient means to educate riders and ensure compliance with park rules. Authorized guide companies, each responsible for the activities of their tour groups, can reduce impacts by: keeping their groups an appropriate distance from wildlife, preventing riders from approaching animals, and reducing noise levels and the time a group remains interacting with a group of animals, etc. Professional guide services with contractual obligations also permit more effective enforcement by NPS rangers and business management personnel. During interviews, Taylor and Cole (2003) found that recreationists often believed that it was acceptable to approach wildlife more closely than the data indicated animals would tolerate. Thus, the education and supervision provided to groups by their commercial guides is predicted to decrease disturbance responses by wildlife. Effects could be further mitigated by prohibiting OSV use from 9 p.m. to 7 a.m. Disturbance and energetic/stress impacts to bison and elk under alternative 4 are predicted to be adverse and moderate.

Displacement. The objective to minimize the avoidance, displacement, or harassment of wildlife from human disturbance is not expected to be accomplished by alternative 4. Levels of snowmobile use comparable to alternative 4 have resulted in minor to moderate impacts to individual bison and elk, so implementation of alternative 4 may not increase effects. Training snowcoach drivers and snowmobile guides in appropriate behavior in the presence of wintering wildlife and prohibiting OSV use from 9 p.m. to 7 a.m. could reduced traffic- related effects. With these mitigation measures in place, displacement impacts to bison and elk under alternative 4 are predicted to be adverse and moderate.

Population- level Impacts. The objective of ensuring no detectable, negative effects on population dynamics is expected to be accomplished by alternative 4. Levels of snowmobile use comparable to alternative 4 have resulted in negligible population- level impacts to bison and elk, so implementation of alternative 4 may not increase effects. Population- level impacts to bison and elk under alternative 4 are predicted to be none to adverse and minor.

Conclusion. Impacts on bison and elk from alternative 4 vary from none to adverse and moderate. The total number of snowmobiles allowed into the park would be similar to historic levels but, because all visitors would be traveling in guided groups, OSV users would be less likely to interact with wildlife and cause mortalities. Thus, overall disturbance and stress to individual bison and elk from alternative 4 may increase compared to alternatives 1- 3. Compared to historical conditions, this alternative would have beneficial impacts on all facets of wildlife- OSV interactions. While the total number of OSVs allowed in the parks would approximate the historical average, all users would be led by professional guides, who would be trained how to avoid causing wildlife displacement or stress, and who would be familiar with likely wildlife locations along the road system. Under such conditions, OSV users would be less likely to interact with wildlife, causing fewer mortalities, less stress, less displacement, and fewer population- level impacts. The impacts associated with alternative 4 would not be of sufficient magnitude to constitute impairment of elk and bison wildlife resources.

ALTERNATIVE 5

In addition to about 18 snowcoaches in YNP per day, this alternative would allow 950 snowmobiles in YNP and 190 in GTNP. This represents an increase over historical conditions, which averaged about 765 snowmobiles per day. Eighty percent of the snowmobiles would be commercially guided and 20% would be non- commercially guided.

Vehicle- related Mortality. The objective of maintaining or reducing the 10- year average of large animals struck by OSVs is not expected to be accomplished by alternative 5. All documented incidents of OSV- wildlife collisions have involved snowmobiles. Because alternative 5 allows more snowmobiles than alternatives 1, 2, 3, and 4, the likelihood of vehicle impacts would increase. However, this risk can be mitigated by speed limits, guiding requirements, and night- driving restrictions. The number of snowmobiles allowed in alternative 5 are 132% above the historical average, so vehicle- caused mortality is predicted to rise significantly. But even with this increase, the overall number of collisions with bison and elk is likely to be small. Under alternative 5 these impacts are predicted to be adverse and minor.

Disturbance and Physiological Responses. The objective of minimizing observed levels of active responses by bison and elk is not expected be accomplished by alternative 5. The higher traffic volumes and hence higher wildlife–OSV interaction rates are likely to result in a higher

number of active responses and more physiological stress to wildlife than under alternatives 1, 2, 3, and 4. This alternative allows for approximately 20% non- commercially guided snowmobiles.

Although the limited data does not allow a projection based solely on the presence of unguided riders, many of the mitigation proposals detailed in Appendix C are predicated on the ability of the NPS to train snowmobile operators. This alternative will include classroom training or Web-based training to ensure that snowmobilers behave appropriately in the presence of wintering wildlife. In contrast, using guides that have training and experience riding with winter wildlife, and a professional obligation to obey NPS regulations, are the most efficient means to educate riders and ensure compliance with park rules. Authorized guide companies, each responsible for the activities of their tour groups, also permit more effective enforcement. Web- based or other non- experiential training, while available to a wider audience, is expected to be less effective in educating snowmobilers about appropriate behavior in the presence of wintering wildlife. However, mandatory training in whatever form is predicted to reduce to some extent the adverse impacts from snowmobilers traveling without commercial guides. During interviews, Taylor and Cole (2003) found that recreationists often believed that it was acceptable to approach wildlife more closely than the data indicated animals would tolerate. Thus, required training for one member of a snowmobiling group is predicted to increase compliance with park rules compared to the unguided snowmobile component of alternative 3. Disturbance effects could further be mitigated by prohibiting OSV use from 9 P.M. to 7 A.M. The disturbance and energetic/stress impacts to bison and elk under alternative 5 are predicted to be adverse and moderate.

Displacement. The objective to minimize the avoidance, displacement, or harassment of wildlife from human disturbance is not expected to be accomplished by alternative 5. While levels of use lower than alternative 5 have resulted in minor to moderate impacts to bison and elk, implementation of alternative 5 would increase snowmobile traffic by 132% which is predicted to significantly increase effects. In addition, alternative 5 will increase these effects compared to alternatives 1- 4 and does not offer a means to minimize them. Thus, displacement impacts to bison and elk under alternative 5 are predicted to be adverse and moderate.

Population- level Impacts. The objective of ensuring no detectable, negative effects on population dynamics is expected to be accomplished by alternative 5. Levels of snowmobile use comparable to alternative 5 have resulted in negligible population- level impacts to bison and elk, so implementation of alternative 5 may not increase effects. Population- level impacts to bison and elk under alternative 5 are predicted to be negligible to adverse and minor.

Conclusion. Impacts on bison and elk from alternative 5 vary from none to adverse and moderate. The total number of snowmobiles allowed into the park would be higher than historic levels but, because most visitors would be traveling in guided groups, OSV users would be less likely to interact with wildlife and cause mortalities. Eighty percent of the groups would be led by professional guides who have been trained how to avoid causing wildlife displacement or stress, and who would be familiar with likely wildlife locations along the road system. Thus, overall disturbance and stress to individual bison and elk from alternative 5 may increase compared to alternatives 1- 4. Compared to historical conditions, this alternative would have negligible beneficial impacts on all facets of wildlife- OSV interactions because all OSV users would be traveling in guided groups. Eighty percent of the groups would be led by professional guides who have been trained how to avoid causing wildlife displacement or stress, and who would be familiar with likely wildlife locations along the road system. Under such conditions, OSVs users would be less likely to interact with wildlife, causing fewer mortalities, less stress,

less displacement, and fewer population- level impacts. The impacts associated with alternative 5 would not be of sufficient magnitude to constitute impairment of elk and bison populations.

Table 45. Summary of OSV- ungulate interactions by road segment (adapted from Davis et al. 2004).

Road Segment[1]	Km Surveyed	Bison/Elk Interactions	Interactions per Km	Exposure to Disturbance
Madison to West Yellowstone (23 km)	2,852	473	0.17	High
Madison to Old Faithful (26 km)	2,990	782	0.26	High
Mammoth to Norris (34 km)	1,700	77	0.05	Medium
Norris to Madison (23 km)	1,196	109	0.09	High
West Thumb to South Entrance (35 km)	245	0	0.00	Low
Fishing Bridge to West Thumb (34 km)	5,168	21	0.004	Low
Canyon Village to Lake Butte (40 km)	5,600	183	0.03	Low
Norris to Canyon Village (19 km)	589	16	0.03	Low
Lake Butte to Sylvan Pass (40 km)	68	4	0.06[2]	Low
West Thumb to Old Faithful (27 km)	648	9	0.01	Low

[1]The sampling period was not the same for all routes. The Norris to Canyon and Fishing Bridge to Sylvan Pass routes were based on the 2002- 2003 season data only, and the West Thumb to Old Faithful and West Thumb to South Entrance route were based on the 2003- 2004 season only. Data for other routes based on sampling both winters (Davis et al. 2004, White et al. 2004).
[2]Very small sample size for this route that was discontinued in the 2002- 2003 season.

Table 46. Summary of impacts to bison and elk.

Impact	Alternatives 1 and 2	Alternative 3	Alternative 4	Alternative 5
OSV- related mortality	Negligible	Negligible	Negligible	Adverse, minor
Disturbance and physiological responses	Adverse, minor to moderate	Adverse, minor to moderate	Adverse, moderate	Adverse, moderate
Displacement	Adverse, minor to moderate	Adverse, minor to moderate	Adverse, moderate	Adverse, moderate
Population- level impacts	None to adverse, negligible	None to adverse, negligible	None to adverse, minor	None to adverse, minor

IMPAIRMENT OF PARK RESOURCES AND VALUES

In addition to determining the environmental consequences of the alternatives, NPS policy (NPS 2000a) requires analysis of potential effects to determine whether actions would impair park resources. In managing National Park System units, the NPS may undertake actions that have both beneficial and adverse impacts on park resources and values. However, the NPS is generally prohibited by law from taking or authorizing any action that would or is likely to impair park resources and values. Actions that would cause an adverse impact, which is considered less serious than an impairment, may also be prohibited. Impacts that may constitute an impairment of park resources or values are to be evaluated and described in impact analyses contained within environmental documents produced by the NPS (Director's Order 12).

Impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. Whether an impact meets this definition depends on the particular resources and values that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts. Impairment may result from activities undertaken by the NPS, visitors, concessionaires, contractors, or other parties in the park. An impact would be more likely to constitute an impairment to the extent that it affects a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or
- Identified as a goal or critical resource in the park's general management plan or other relevant NPS planning documents.

An impact would be less likely to constitute an impairment to the extent that it is an unavoidable result, which cannot reasonably be mitigated, of an action necessary to preserve or restore the integrity of park resources or values.

For the purposes of this EA, impairment of park resources was evaluated on the basis of the type and intensity of impact and in terms of the types of resources affected. In general, beneficial impacts do not constitute impairment. With respect to the intensity of impacts, negligible and minor adverse impacts generally are not of sufficient magnitude to constitute impairment. Moderate and major adverse impacts may constitute impairment, but do not automatically do so. Rather these impacts must be analyzed with respect to the considerations outlined above.

The Final EIS ROD (November 22, 2000) concluded that, of the seven alternatives evaluated in the Final EIS, only one (alternative G) did not exceed a level of impairment under NPS policy. This was the primary basis for selecting this alternative, as explained in the ROD. Alternative G in the Final EIS, which called for the phase- out of snowmobile use in the parks, was found not to result in impairment of park resources or values whose impacts are disclosed in the Final EIS. In all other Final EIS alternatives, snowmobile use in YNP was found to impair air quality, wildlife, the natural soundscape, and opportunities for enjoyment of the park by visitors. In GTNP, impairment was found to result from snowmobile and snowplane use on the natural soundscape and opportunities for enjoyment of the park. In the Parkway, impairment was found to result from snowmobile use on air quality, the natural soundscape, and opportunities for

enjoyment of the park. There is no new evidence contradicting the finding that historically unlimited snowmobile use impairs park resources and values.

The final EIS ROD, based on the information available at the time, found impairment for all alternatives with snowmobile use, including those that would have required phased- in use of cleaner and quieter snowmobiles in accordance with objectives set for sound and air emissions. It was determined that there was no way to mitigate the impairment short of reducing the amount of use as determined by an effective carrying capacity analysis, or by imposing a limit unsupported by such an analysis (ROD, pages 18- 19).

The rule implementing Final EIS alternative G, published in the Federal Register on January 22, 2001, recognized that "achieving compliance with the applicable legal requirements while still allowing snowmobile use would require very strict limits on the numbers of both snowmobiles and snowcoaches" (Fed. Reg. vol. 66, no. 14, pg. 7562). Thus, through appropriate management actions, the November 2000 ROD and the January 2001 rule recognized that snowmobile and snowcoach use could possibly be accommodated in YNP and GTNP without constituting impairment to park resources and values. The SEIS and the March 25, 2003, ROD reinforced these conclusions.

ALTERNATIVE 1

When fully implemented, alternative 1 would not impair park resources or values. The actions described in this alternative do not severely affect a resource or value whose conservation is 1) necessary to fulfill specific legislative purposes; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the park's general management plan or other relevant NPS planning documents.

Alternative 1 represents implementation of the November 22, 2000 ROD. This ROD found that the impacts associated with the actions proposed by alternative 1 would not constitute an impairment of park resources and values. Although adverse impacts could occur under these alternatives to wildlife, air quality, and noise from mass transit use, they are at low levels, generally short term, and may be mitigated. The analysis in this EA supports that conclusion.

ALTERNATIVE 2

When fully implemented, alternative 2 would not impair park resources or values. The actions described in this alternative do not severely affect a resource or value whose conservation is 1) necessary to fulfill specific legislative purposes; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the park's general management plan or other relevant NPS planning documents. Although adverse impacts could occur under this alternative to wildlife, air quality, noise, and visitor experience, impacts are at acceptable levels, generally short term, and may be mitigated through management actions.

NPS believes this alternative would not constitute impairment to park resources or values for several reasons. This alternative is similar to the visitation patterns associated with the winter of 2003- 2004. During this winter, monitoring of air quality, natural soundscapes, employee health and safety, wildlife, and water quality occurred. The monitoring data from this winter season illustrated that this type and level of snowmobile use can be accommodated in the parks without impairing park resources or values. In addition, this EA continues intensive monitoring of these

park resources and values. Monitoring data from the interim period of this EA will provide the NPS with additional information to assess the impacts of alternative 2 to park resources and values. This monitoring data will be used to help better inform the long- term analysis regarding the future of winter use in the parks. The thresholds identified in the March 2003 ROD are included as Appendix B of this EA. These thresholds are a tool for managers to help determine if the goals and objectives of the winter use plan are being achieved. They will continue to be employed and evaluated throughout the duration of this EA. The superintendents of the parks may take emergency actions to protect park resources and values if necessary.

Alternative 2 is an intensively managed approach to preventing impairment of park resources and values through strict requirements on snowmobiles and snowcoaches and comprehensive monitoring. Alternative 2 sets daily entry limits that represent a use level less than half the historical average number of snowmobiles entering YNP. Limits on the numbers of snowmobiles will result in fewer conflicts with wildlife, fewer air and noise emissions, and improved road conditions. Limits on the numbers of snowmobiles also provide park managers with more predictable winter use patterns and an assurance that use cannot increase.

This alternative also mandates that all snowmobilers enter the park accompanied by commercial guides. This requirement will reduce conflicts with wildlife along roadways because guides will be trained to deal with such situations. Guided parties tend to be larger in size, which reduces the overall number of encounters with wildlife. Commercial guides are required to be educated in safety and are knowledgeable about park rules. Commercial guides must also have reasonable control over their clientele, which greatly reduces unsafe and illegal snowmobile use. In this way, guides will ensure that park regulations are enforced and will provide a safer experience for visitors.

Finally, this alternative requires that both snowmobiles and snowcoaches entering the park are BAT for noise and air emissions. This requirement will ensure that all recreational OSVs operating in the parks employ state of the art emissions control equipment. Currently, BAT snowmobiles are capable of reducing HC by 90 and CO by 70%. Further, BAT snowmobiles are capable of operating at or below 73 dB, whereas standard two- stroke snowmobiles operate at 75 to 78 dB.

ALTERNATIVE 3

When fully implemented, this alternative would not impair park resources or values. The actions described in this alternative do not severely affect a resource or value whose conservation is 1) necessary to fulfill specific legislative purposes; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the park's general management plan or other relevant NPS planning documents. Although adverse impacts could occur under this alternative to wildlife, air quality, noise, and visitor experience, impacts are at acceptable levels, generally short term, and may be mitigated through management actions.

NPS believes this alternative would not constitute impairment to park resources or values for several reasons. This EA continues intensive monitoring of park resources and values, including air quality, natural soundscapes, wildlife, employee health and safety, visitor experience. Monitoring data from the interim period of this EA will provide the NPS with additional information to assess the impacts of alternative 3 to park resources and values. This monitoring

data will be used to inform the long- term analysis regarding the future of winter use in the parks. The thresholds identified in the March 2003 ROD are included as Appendix B of this EA. These thresholds are a tool for managers to help them determine if the goals and objectives of the winter use plan are being achieved. They will continue to be employed and evaluated throughout the duration of this EA. The superintendents of the parks may take emergency actions to protect park resources and values if necessary.

Alternative 3 is an intensively managed approach to preventing impairment of park resources and values through strict requirements on snowmobiles and snowcoaches and comprehensive monitoring. Alternative 3 sets daily entry limits that that represent about 70% of the historical average daily snowmobile use in YNP. Limits on the numbers of snowmobiles will result in fewer conflicts with wildlife, fewer air and noise emissions, and improved road conditions. Limits on the numbers of snowmobiles also provide park managers with more predictable winter use patterns and an assurance that use cannot increase.

Under this alternative about 82% of the entries will be via commercially guided tours, while the remaining 18% will be unguided. This requirement will reduce conflicts with wildlife along roadways because guides will be trained to deal with such situations. Guided parties tend to be larger in size, which reduces the overall number of encounters with wildlife. Commercial guides are required to be educated in safety and are knowledgeable about park rules. Commercial guides must also have reasonable control over their clientele, which greatly reduces unsafe and illegal snowmobile use. In this way, guides will ensure that park regulations are enforced and will provide a safer experience for visitors.

Finally, this alternative requires that both snowmobiles and snowcoaches entering the park are BAT for noise and air emissions. This requirement will ensure that all recreational OSVs operating in the parks employ state of the art emissions control equipment. Currently, BAT snowmobiles are capable of reducing HC by 90% and CO by 70%. Further, BAT snowmobiles are capable of operating at or below 73 dB, whereas standard two- stroke snowmobiles operate at 75 to 78 dB.

ALTERNATIVE 4

When fully implemented, alternative 4 would not impair park resources or values. The actions described in this alternative do not severely affect a resource or value whose conservation is 1) necessary to fulfill specific legislative purposes; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the park's general management plan or other relevant NPS planning documents. Although adverse impacts could occur under this alternative to wildlife, air quality, noise, and visitor experience, impacts are at acceptable levels, generally short term, and may be mitigated through management actions.

NPS believes this alternative would not constitute impairment to park resources or values for several reasons. This EA continues intensive monitoring of park resources and values, including air quality, natural soundscapes, wildlife, employee health and safety, visitor experience. Monitoring data from the interim period of this EA will provide the NPS with additional information to assess the impacts of alternative 4 to park resources and values. This monitoring data will be used to inform the long- term analysis regarding the future of winter use in the parks. The thresholds identified in the March 2003 ROD are included as Appendix B of this EA.

These thresholds are a tool for managers to help them determine if the goals and objectives of the winter use plan are being achieved. They will continue to be employed and evaluated throughout the duration of this EA. The superintendents of the parks may take emergency actions to protect park resources and values if necessary.

Alternative 4 is an intensively managed approach to preventing impairment of park resources and values through strict requirements on snowmobiles and snowcoaches and comprehensive monitoring. Alternative 4 sets daily entry limits that represent a use level just under the historical average number of snowmobiles entering YNP and will eliminate peak use days experienced in the past. Limits on the numbers of snowmobiles will result in fewer conflicts with wildlife, fewer air and noise emissions, and improved road conditions. Limits on the numbers of snowmobiles also provide park managers with more predictable winter use patterns and an assurance that use cannot increase.

This alternative also mandates that all snowmobilers enter the park accompanied by commercial guides. This requirement will reduce conflicts with wildlife along roadways because guides will be trained to deal with such situations. Guided parties tend to be larger in size, which reduces the overall number of encounters with wildlife. Commercial guides are required to be educated in safety and are knowledgeable about park rules. Commercial guides must also have reasonable control over their clientele, which greatly reduces unsafe and illegal snowmobile use. In this way, guides will ensure that park regulations are enforced and will provide a safer experience for visitors.

Finally, this alternative requires that both snowmobiles and snowcoaches entering the park are BAT for noise and air emissions. This requirement will ensure that all recreational OSVs operating in the parks employ state of the art emissions control equipment. Currently, BAT snowmobiles are capable of reducing HC by 90% and CO by 70%. Further, BAT snowmobiles are capable of operating at or below 73 dB, whereas standard two- stroke snowmobiles operate at 75 to 78 dB.

ALTERNATIVE 5

When fully implemented, alternative 5 would not impair park resources or values. The actions described in this alternative do not severely affect a resource or value whose conservation is 1) necessary to fulfill specific legislative purposes; 2) key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or 3) identified as a goal in the park's general management plan or other relevant NPS planning documents. Although adverse impacts could occur to wildlife, air quality, noise, and visitor experience, they are at acceptable levels, generally short term, and may be mitigated through management actions.

Alternative 5 is the March 25, 2003, decision of the NPS that concluded the SEIS process. The SEIS analysis found that implementing this decision would not impair park resources and values. The analysis in this EA supports the findings in the SEIS. NPS believes this alternative would not constitute impairment to park resources or values for several reasons. This EA continues intensive monitoring of park resources and values, including air quality, natural soundscapes, wildlife, employee health and safety, visitor experience. Monitoring data from the interim period of this EA will provide the NPS with additional information to assess the impacts of alternative 5 to park resources and values. This monitoring data will be used to help better

inform the long- term analysis regarding the future of winter use in the parks. The thresholds identified in the March 2003 ROD are included as Appendix B of this EA. These thresholds are a tool for managers to help them determine if the goals and objectives of the winter use plan are being achieved. They will continue to be employed and evaluated throughout the duration of this EA. The superintendents of the parks may take emergency actions to protect park resources and values should the need arise.

Alternative 5 is an intensively managed approach to preventing impairment of park resources and values through strict requirements on snowmobiles and snowcoaches and comprehensive monitoring. Alternative 5 sets daily entry limits that will eliminate the peak- use days which were often associated with the impacts that led park managers to previously conclude park resources and values were being impaired. Limits on the numbers of snowmobiles will result in fewer conflicts with wildlife, fewer air and noise emissions, and improved road conditions. Limits on the numbers of snowmobiles also provide park managers with more predictable winter use patterns and an assurance that use cannot increase.

This alternative also mandates that all snowmobilers enter the park accompanied by guides. Eighty percent of the entries will be via commercially guided tours, while the remaining 20% will be on non- commercially guided tours. This requirement will reduce conflicts with wildlife along roadways because guides will be trained to deal with such situations. Guided parties tend to be larger in size, which reduces the overall number of encounters with wildlife. Commercial guides are required to be educated in safety and are knowledgeable about park rules, and a training program will ensure that non- commercial guides receive similar, albeit shorter, training. Commercial guides must also have reasonable control over their clientele, which greatly reduces unsafe and illegal snowmobile use. In this way, guides will ensure that park regulations are enforced and will provide a safer experience for visitors.

This alternative requires that both snowmobiles and snowcoaches entering the parks meet BTA requirements for noise and air emissions. This requirement will ensure that all recreational OSVs operating in the parks employ state of the art emissions control equipment. Currently, BAT snowmobiles are capable of reducing HC by 90% and CO by 70%. They can also operate at or below 73 dB, whereas standard two- stroke snowmobiles operate at 75 to 78 dB.

DIRECT, INDIRECT, AND CUMULATIVE IMPACTS ON ADJACENT LANDS

Because all the alternatives in this EA are within the scope of those in the SEIS, which considered average daily snowmobile numbers ranging from 0 to 950, the analysis of possible impacts on adjacent lands resulting from these five alternatives is very similar to that presented in the Final EIS (pages 434 through 474), and in the Final SEIS (pages 246- 251). There is little new information that would substantially alter the analysis of effects for the EA alternatives. The discussions below are therefore summarized from the Final EIS and the Final SEIS.

Potential effects on lands within the GYA other than the three national park units are discussed in this section. The potential for impacts on adjacent lands (apart from economic impacts) is primarily due to possible displacement of winter recreation use from the parks. However, the displacement of visitors onto surrounding federal, state, or county lands as a result of implementation of an alternative in this EA is speculative. Many different scenarios can be

constructed for the same basic situation (for example, allowing 540 snowmobiles into YNP daily). Additional permutations are added when multiple alternatives must be dealt with, and even more when dealing with four major gateways and several other access routes. A partial list of possible considerations follows.

Many non- resident visitors that currently snowmobile in the parks also snowmobile on the adjacent national forests. If they cannot snowmobile in the park from the gateway of their choice as a result of an alternative chosen in this EA, they could:

- Continue to visit in future years but spend their time exclusively on national forest lands. The net increase would be the one or two days per trip previously spent in the parks.
- Continue to visit in future years but spend their time on national forest lands as before and shorten their trip.
- Decline to come to the GYA and forego both national forest and park experiences.
- Continue to visit the GYA, spend as many days on the national forests as they do now and visit the parks using another gateway or a different mode of transport.

Other considerations include the possibility of attracting new visitors with different preferences, and different local users. Some people who have not come to the parks in the past might choose to do so because of available mass transit opportunities, either on plowed roads or groomed oversnow routes. Such visitors could split their trips to spend a day snowmobiling on the adjacent national forests. Local snowmobilers would likely continue to use national forest lands as they have in the past. If they can no longer use the parks as they have traditionally done from their local community, they could:

- Enter the parks from another available gateway.
- Leave the region and go elsewhere for one to several trips over the season.
- Curtail their activity overall.
- Spend more time on local national forest lands.
- Visit national forest lands near other gateways.

Definitive information about what people would do under a variety of scenarios cannot be obtained. (Council on Environmental Quality regulations at 40 CFR part 1502.22 addresses the issue of incomplete or unavailable information for use in NEPA compliance.) The best available data is from surveys (Duffield 2000) of winter visitors in the parks. The results indicate what people may do under circumstances posed by various alternatives. These surveys are the basis for impacts described in the socioeconomic section of this chapter and are cited there.

The Final EIS presents scenarios of recreation displacement for each of its alternatives. These represent the most reasonable outcomes based on known preferences of visitors through visitor surveys and current use at each park gateway. Appendix J in the Final EIS provides supporting computations for this displacement analysis, including assumptions and methods. The following analysis is based upon that analysis, the SEIS analysis, and what happened during the 2003- 2004 winter season in the GYA.

ALTERNATIVE DISPLACEMENT SCENARIOS

Alternative 1

Alternative 1 would be the same as in alternative G from the Final EIS, and alternatives 1a and 1b from the SEIS, all of which called for a transition to a snowcoach- only winter transportation

system. This alternative could result in the greatest amount of snowmobile visitation being shifted to the national forests and state and county lands adjacent to Yellowstone.

Specifically, under this alternative, some visitors would visit more often under a snowcoach-only system, some would not alter their visitation patterns, and others would visit less often and/or shift their visits more to the areas adjacent to Yellowstone. As analyzed in the previous EIS and SEIS and based on survey responses of current winter visitors about what they would do if the parks were open for snowcoach access only, total visitation to the GYA by those who live outside the five- county area would have a net reduction of about 33.4% (non- resident visitors account for about 80% of park visitation). Nearly 60% of the visitors who snowmobiled on their trip said they would visit the GYA less frequently if a snowcoach- only system were instituted. An across- the- board decrease of 33.4% could offset or exceed any potential increase in use locally as a result displaced park use. About 5,230 snowmobile trips into the parks annually are associated with visitors who indicate they would visit the GYA the same amount, but would go to other destinations. This means that a total of about 65 snowmobile trips daily could be displaced to other land outside the parks near all gateways. This would be in addition to resident visitors (accounting for about 20% of park visitation) who currently recreate primarily on adjacent lands.

Conflicting with this information was visitation to the national forests around YNP last winter, when YNP visitation was restricted to 493 and then 780 snowmobiles per day. Rather than displacing visitors onto surrounding federal, state, or county lands, such limits had little apparent effect on visitation to national forests. Snowmobile use on the Hebgen Lake District of the Gallatin National Forest, adjacent to West Yellowstone, declined about 37%, suggesting that instead of displacing snowmobilers to surrounding lands, restrictions on Yellowstone visitation may curtail region- wide visitation. With only one winter of data, however, conclusive findings are impossible to reach, emphasizing the speculative nature of this issue.

Further confounding the discussion is the possibility that visitation to Yellowstone has been dropping significantly for several winters, probably reflecting confusion about continued snowmobile access to the parks. Visitation to Yellowstone in the 2004- 2004 season was well below even the more restrictive daily limit of 493 snowmobiles daily. That visitation did not even approach the daily limit suggests that displacement of visitors onto surrounding national forest lands by restrictions on Yellowstone access did not, and would not occur.

Alternative 2

This alternative differs from alternative 1 only in allowing 318 snowmobiles daily into Yellowstone and 50 into Grand Teton National Park. While such visitation is considerably lower than the average visitation to the parks in the past 12 years, it approximates the average daily visitation from the 2003- 2004 season. Consequently, visitation to surrounding federal, state, and county lands could remain at that level. Visitation to surrounding lands could increase if visitors are displaced there, but the effects of this alternative in any case would be similar to those of alternative 1, because a limit of only 318 snowmobiles per day into YNP is considerably more restrictive than historical visitation, the winter of 2003- 2004 notwithstanding.

Under this alternative, all snowmobiles touring the parks would have to meet BAT requirements. Because few snowmobile owners in the three surrounding states own BAT compliant vehicles, most local residents that previously toured YNP by snowmobile will either need to rent a BAT machine or will elect not to visit the park. These visitors could be displaced to surrounding

federal, state, or county lands. However, most local residents already recreate primarily on surrounding national forest lands instead of in the park, so the effects of BAT requirements on them and thus national forest recreation are unlikely to be significant. Further, the decreased visitation to surrounding national forests during the 2003- 2004 winter contradicts the possibility that use of adjacent federal, state, and county lands would increase under this alternative, instead suggesting that restricted access to YNP could result in less visitation on lands adjacent to the park. Such reduced visitation could relieve strain on national forest, state, and county land infrastructure and resources, some of which are currently stressed by high winter visitation.

Alternative 3

As with alternatives 1 and 2, this alternative could result in slightly higher visitation to surrounding federal, state, and county lands. Because daily entrance limits to the parks would be higher under this alternative (540 per day for Yellowstone) than either alternatives 1 or 2, the number of displaced visitors would probably be less. However, since those same limits would be less than those under alternatives 4 or 5, this alternative could result in more displaced users. Again, though, last winter's experience of decreased snowmobile numbers on the adjacent national forests contradicts this possibility, suggesting instead that visitation to those lands could decrease under this alternative. BAT requirements under this alternative would have effects similar to those under alternative 2.

Alternative 4

Because this alternative would allow a number of snowmobiles into the parks that is near the historical average daily visitation, it would be unlikely to result in significant visitor displacement to surrounding federal, state, or county land, except during high use periods (Christmas week and Presidents Day weekend). Further, the daily visitation limits after February 10, 2004 (780 per day) were never reached strongly reaffirms that the approximately equal daily numbers allowed under this alternative would not affect visitation to the surrounding national forests. Further, the fact that last winter's national forest snowmobile visitation dropped even though visitation to YNP was significantly limited lends further support to this conclusion. Still, on days when more than 720 snowmobile visitors wanted to enter YNP, some could be displaced to surrounding lands. The experience of the 2003- 2004 season, instead suggests that reduced visitation to the park could mean reduced visitation on the lands around the park. BAT requirements under this alternative would have effects similar to those under alternative 2.

Alternative 5

This alternative is, in respect to the amount and type of access and the allowable snowmobile use, essentially the same as the Final EIS alternative A and the SEIS alternatives 2 or 4, all of which proposed about 950 snowmobiles to be allowed daily into YNP. That number is more than the approximate historical daily snowmobile visitation to the parks. Consequently, there would be no redistribution of use other than what could happen as a result of events unrelated to winter use management in the parks.

On days when more than 950 snowmobile visitors wanted to enter YNP, there could be some diversion to national forests. On average, about 50 snowmobiles could be diverted on such days from the West Entrance and presumably onto adjacent federal, state, or county lands. Again, though, this possibility is contradicted by 2003- 2004 visitation on the national forests

surrounding YNP, when park visitation dropped as much as 37%. BAT requirements under this alternative would have effects similar to those under alternative 2.

CUMULATIVE IMPACTS

The alternatives evaluated here are within the range of alternatives for which cumulative effects were analyzed in the Final EIS (pages 478- 485) and the Final SEIS (pages 251- 254), to which this discussion is tiered. Cumulative impacts on resources and values for which analysis of effects is presented in those documents are discussed here.

METHOD

Cumulative impacts analysis considers the degree to which any direct or indirect effects from proposed actions adds to or detracts from the possible effects of other past, present, or reasonably foreseeable actions. Since effects of actions are specific to each impact topic, resource or value of concern, the types of actions and overall nature of impacts considered in this analysis are disclosed for each. Each impact topic is associated with a specific area of concern, and with impact sources that could affect the resource within that area. If an action or an alternative could have a direct or indirect effect, then this effect is considered additive with the effects of other impact sources. Conversely, if an action does not have a direct or indirect effect, no additive cumulative effect exists.

SOCIOECONOMICS

The appropriate level for viewing cumulative economic impacts is at the aggregate level for the GYA. The counties of the GYA are in a period of general prosperity, characterized by economic growth and low unemployment. This growth is largely fueled by desirable residential and quality of life environments, increasing tourism, and the ability of independent entrepreneurs to be located in desirable working environments some distance from their key markets. This is more than offsetting the decline of the traditional resource extraction industries in the regional economy, although it should be noted that average wages between the two sectors are not equal (with resource industries' being generally higher). During the general trend of growth through the period, it should be noted that annual levels of tourist visitation have been generally static during the past several years. To the extent that the alternatives tend to increase recreational visitation, this is additive to the existing trend. To the extent that the alternatives tend to reduce recreational visitation, the negative impacts are somewhat offset by the positive regional economic trend related to wildlife and natural environment. This is the only cumulative impact identified in this section. All alternatives evaluated here are intended to maintain the current level of recreational visitation in the parks, although modes of access differ. Therefore, the cumulative impact identified would not appear to vary substantially within the economic region by alternative.

AIR QUALITY

Area of Concern. The area of concern includes the airshed described by all three park units and by adjacent Class I areas on national forests. Although ambient air pollution generated at great

distances beyond the park boundaries are of concern compared to air quality in the park, it is unreasonable to consider the whole of the western United States as an area of concern.

Potential Impact Sources. Additional pollution comes from regional industry located within 150 km of the park. Industries include oil and gas processing, power plants, and industrial combustion. Levels of nitrates found in YNP's snowpack can be related to regional industry (Ingersol et al. 1997). Current impact sources within the parks that could affect park air resources during the winter include emissions from two- stroke engines (outside of the parks) and other motorized wheeled vehicles or internal combustion engines that operate on roads within the parks, as well as wood- burning stoves. During other seasons, human- related sources of pollution include motor boats, gasoline powered maintenance equipment, recreational vehicles, buses, generators, ambient sources, automobiles, campfires, and road material processing equipment. Forest fires in both the parks and national forests impact air quality during the summer and fall seasons. There is no known connection between potential sources of air pollution in the winter and potential sources in the summer. Therefore, these sources are not considered additive as cumulative effects. Effects on vegetation, or other air quality- related values from auto emissions, are largely hypothetical. Such an impact could be attributed to the large amount of summer automobile use when plants are actively respiring.

Additional Impact. Obvious visual effects of air pollution in YNP and GTNP are usually short term and local. The cumulative effect of winter use, added to other possible sources of pollution in the parks, is considered to be short term and localized around parking destination and staging areas, entrance stations, and attractions such as Old Faithful. Effects other than visibility are of concern in these local areas, including health impacts. In alternatives 2, 3, 4, and 5 the application of Best Available Technology (BAT) could result in a net reduction of cumulative impacts within the area of concern compared to historical conditions. In alternative 1, elimination of snowmobiles could significantly reduce the risk of degrading air quality- related values in these Class I areas. In alternatives 1, 2, and 3, increased snowcoach use (compared to current use) would offset some of the gain, but the amount of air pollution generated per visitor would be significantly lower.

BISON

Area of Concern. The area of concern is that which is used by bison for wintering and seasonal migration. Generally, the area includes the corridor and adjacent available winter forage areas in the northern area of YNP and into Montana, and the western corridor along the Firehole and Madison Rivers.

Potential Impact Sources. Because the area of concern is tied to bison winter habitat, impact sources include winter uses—motorized and non- motorized—which displace bison from that particular habitat or render the habitat unusable for them. Activities such as road grooming that facilitate bison movement in the winter with less energy expenditure also facilitate the recreational uses that can stress bison and cause higher energy expenditures. Bison movement along groomed and open roads can lead to the complex economic and social issue of migration beyond park boundaries. Bison have been shown, however, to leave the park more in response to a variety of mostly natural factors, and often not on groomed roads. For further evaluation of impact sources refer to the Bison Management Plan/EIS.

Additional Impact. For consideration of the total cumulative impact on bison and how winter use contributes to it, this analysis incorporates the Bison Management EIS and Plan. Refer also to the disclosure of direct and indirect effects earlier in this chapter.

Other Ungulates

Area of Concern. The area of concern includes habitat for various species within the three park units and other seasonal habitat beyond the parks' boundaries. Ungulate species are migratory and some herd units disperse onto adjacent jurisdictions and land ownership primarily for winter habitat and forage.

Potential Impact Sources. Other impact sources include those that might occur on adjacent lands. This includes conflicts with other human use activities such as ranching, hunting, and general recreation. Development on private lands, loss of open space habitat, and road construction on other federal jurisdictions are other possible sources. Comparable actions within the parks are also impact sources— housing and road construction, grazing in GTNP, as well as increased recreational use. The most relevant impact sources are those that occur during the winter, in or outside of the parks.

Additional Impact. The direct and indirect effects described for winter uses in the parks are key limiting elements for cumulative impacts. Stressed animals or herds whose winter forage options have become limited are likely to be affected cumulatively, through the additional impacts imposed by winter recreation in the parks.

Natural Soundscapes

Areas of Concern. The area considered for cumulative impact assessment is natural soundscapes within the boundaries on three park units.

Potential Impact Sources. Because individual sources of sound are transient and short lived, the potential cumulative impact on the winter soundscape are those sounds occurring during that time. Sounds other than those that naturally occur in the park units during the winter include the sound of wheeled vehicular traffic along roads, the sound of oversnow vehicles on groomed routes, aircraft overflights, and sounds coming from the facilities in developed areas that are open in the winter.

Additional Impacts. Where open facilities coincide with roads and OSV activities, the natural soundscape is affected. There are areas in the parks where the total cumulative effect is such that it obliterates the natural soundscape for most of a winter day. On a relative scale, there would be less cumulative impact under alternative 1. The relationship is defined by the numbers of vehicles allowed in each alternative.

Visitor Experience

Areas of Concern. The area considered for cumulative impact assessment is that within the boundaries of the three park units.

Potential Impact Sources. Because visitor experience is a multi- faceted value, during the winter it can be affected by a large variety of sources. This EA illustrates the sights and sounds of a variety of modes of transport including buses, trucks, groomers, and autos. Visitor experience is also affected by the numbers of other visitors. Ambient human- caused noise such as aircraft overflights generally affects visitor experience. When crowding results because facilities such as lodges, restrooms, or comfort stations can not accommodate the amount of visitor use, the quality of the experience declines. Responding to this problem, the number of facilities can grow to a point where the park no longer reflects its mission of providing a natural environment. In terms of impacts, all potential sources boil down to the number and the relative obtrusiveness of other people, facilities, and transport vehicles. As these sources increase per unit area other impacts may be evident, such as the impact of viewing disturbed wildlife.

Additional Impacts. The indices to cumulative impacts on visitor experience are the number and relative obtrusiveness of other people, facilities, and transport vehicles. The alternatives have increasing levels of cumulative impact, with alternative 5 having the most.

ADVERSE EFFECTS THAT CANNOT BE AVOIDED

The range of adverse effects in this EA's alternatives lies within that range disclosed in the Final SEIS and the Final EIS. Each alternative would result in some impacts.

Impacts are discussed for human health and safety, the economic and social environment, physical and biological resources, and the experiential environment of the three parks. These elements are interrelated and interdependent, as is the nature of any ecosystem process and the human role in it. Therefore, the alternatives taken together display consequences, tradeoffs, benefits, impacts, and opportunity costs in a way that reveals the interdependent working of human and natural park systems. This means that, considering the human use and enjoyment of national parks, an adverse impact from one perspective is often a benefit from another. For example, a change from historical conditions to management under alternative 1 results in the loss of experiential quality for snowmobilers in the parks although these visitors may still avail themselves of motorized access using snowcoaches. At the same time, visitors who have avoided the parks because of the presence of snowmobiles, or who have been unable to enjoy a quality experience because of their presence, will benefit from this change. Any alternative that has been evaluated can be viewed in the same light.

Potential unavoidable adverse economic impacts on the regional economy are disclosed for all alternatives that depart from the historical conditions described in the Final EIS, the Final SEIS, and this EA. The decrease or loss of snowmobiling opportunities in the parks readily equates to an adverse economic impact. These impacts are not considered irreversible or long term in the context of the total economy. For some individual businesses, the effects may be more drastic, as they were during the 2003- 2004 winter for some. It is, however, in the nature of business to start or change course based on economic self- interest and survival. Long- term economic impacts are not easy to determine because of this dynamic, and because the business world is adaptable and creative. So, as indicated in the analysis, it is possible that the negative regional impacts of some alternatives could be offset by a change in the type and mix of visitors coming to the parks.

Potential unavoidable adverse impacts on physical and biological resources are disclosed through the range of EA alternatives. These include impacts on air quality, wildlife displacement

and habituation, and natural quiet. For the most part, any such impacts are short term (for the duration of this plan) and minor or moderate for alternatives that reduce average snowmobile levels. Other possible minor to moderate impacts would be mitigated or avoided by the features of the alternatives or the recommended mitigation measures expressed in specific analyses.

Historical adverse impacts on human health and safety decline under most alternatives that reduce average snowmobile levels. The focal points regarding health and safety herein are air quality and emissions from OSVs. The desired impact is beneficial in reducing these factors. Allowing the range of winter recreational use and access, which is implicit in the purpose and need, carries with it the unavoidable potential for accidents. Unavoidable impacts are referred to in the beginning of this chapter, "Effects Common to all Alternatives." These result from winter use of the parks at any level, and they include impacts on natural soundscape, wildlife (collisions, displacement), safety; and visitor experience.

IRREVERSIBLE OR IRRETRIEVABLE COMMITMENTS OF RESOURCES

An irreversible commitment of resources is defined as the loss of future options. The term applies primarily to the effects of using nonrenewable resources, such as minerals or cultural resources, or to those factors, such as soil productivity that are renewable only over long periods. It could also apply to the loss of an experience as an indirect effect of a "permanent" change in the nature or character of the land.

An irretrievable commitment of resources is defined as the loss of production, harvest, or use of natural resources. The amount of production foregone is irretrievable, but the action is not irreversible. If the use changes, it is possible to resume production. An example of such a commitment would be the loss of cross- country skiing opportunities as a result of a decision to allocate an area to snowmobile use only. If the decision were reversed, skiing experiences, though lost in the interim, would be available again.

From an economic or social perspective, there would be no irreversible commitment of resources from any of the alternatives. However, alternatives to the current management situation that change recreational opportunities or affect visitors by displacing them from accustomed usage would involve irretrievable losses. By the nature of alternative actions, those losses would be balanced by a gain in some other opportunity or resource benefit. Any perceived losses or tradeoffs in recreational opportunities would have both social and economic consequences that would be irretrievable, but not irreversible.

By virtue of the alternative actions, which are fully within the protective orientation of the NPS mission, and the analysis of effects from them, there would be no irretrievable commitments of any resources. No environmental consequences have been determined that involve the permanent loss of a resource or jeopardy to the existence of any species on the basis of the proposed actions alone. Were it indicated that the presence of existing or proposed levels of snowmobile trail use could cause grizzly bear mortality, then there would be a risk of irreversible and irretrievable commitment of resources. As stated, no such impacts were determined in this analysis.

The five alternatives prescribe differing mixes of winter visitor experience. The changes are intended to address the purpose and need for action described in Chapter I, while sharply defining the public's issues about the proposal. In alternative 1, the consequences of those changes improve the quality or condition of the parks' experiential values and resources. This includes improving values like air quality, natural quiet, wildlife species and habitat, and recreation experiences (motorized and non- motorized) whose quality is dependent on those values. The achievement of such improvements is accompanied by some tradeoff in another aspect of winter recreation such as loss of snowmobiling opportunities, available modes of transport, redistribution of use, or regulating types of equipment allowed. All these changes or tradeoffs would be associated with an irretrievable loss of the kind indicated. Conversely, for alternatives that provide a full range of winter recreation opportunities, including snowmobiling, there would be tradeoffs representing irretrievable losses in types and qualities of other visitor experiences. For the range of alternatives, a variety of irretrievable resource commitments would be made, but none would be irreversible.

CHAPTER V: LIST OF PREPARERS

PROJECT MANAGEMENT AND COORDINATION

Gary Pollock, Management Assistant, Grand Teton National Park.
John Sacklin, Management Assistant, Yellowstone National Park.
Kevin Schneider, Outdoor Recreation Planner, Yellowstone National Park.
Mike Yochim, Outdoor Recreation Planner, Yellowstone National Park.

TECHNICAL EXPERTISE

Tami Blackford, Writer- Editor, Yellowstone National Park. Editing and layout.
Shan Burson, Ecologist, Grand Teton National Park. Soundscape analysis.
Troy Davis, Biological Science Technician, Yellowstone National Park. Wildlife analysis.
Mary Ann Franke, Writer- Editor, Yellowstone National Park. Editing and layout.
Bruce Peacock, Economist, National Park Service. Socioeconomics analysis.
Barry Roth, Deputy Associate Solicitor, Division of Parks and Wildlife, Solicitor's Office, U.S. Department of the Interior.
Christine Turk. Intermountain Region Environmental Quality Coordinator. NEPA assistance.
Deborah Van DePolder, Planning Assistant, Yellowstone National Park. Administrative record support.
Jason Waanders, Attorney- Advisor, Division of Parks and Wildlife, Solicitor's Office, U.S. Department of the Interior.
Aaron Worstell, Air Resource Specialist, NPS Air Resources Division. Air quality analysis.

NATIONAL PARK SERVICE CONSULTANTS

Janet Heeter, Air Resource Specialists. Air quality analysis.
D. Howard Gebhart, Air Resource Specialists. Air quality analysis.
Carol Cole, Northwind Environmental. Public comment analysis.
Greg Lively, Northwind Environmental. Public comment analysis.
Randy Morris, Northwind Environmental. Public comment analysis.
Carol Mansfield, RTI International. Socioeconomics analysis.
Robert Beach, RTI International. Socioeconomics analysis.

MANAGEMENT SUPPORT

Jim Bellamy, Deputy Superintendent, Grand Teton National Park.
Mary Gibson Scott, Superintendent, Grand Teton National Park.
Kym Hall, Special Assistant, National Park Service.
R. Durand Jones, Deputy Director, National Park Service.
Suzanne Lewis, Superintendent, Yellowstone National Park.
Steve Martin, Regional Director, Intermountain Region.
Cheryl Matthews, Acting Chief of Public Affairs, Yellowstone National Park.
Al Nash, Public Affairs Specialist, National Park Service.
Franklin Walker, Deputy Superintendent, Yellowstone National Park.

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APPENDIX A: MOTORIZED OVERSNOW VEHICLE ACCESS SCENARIOS

INTRODUCTION

The development of scenarios that distribute use within the parks, based on entrance limits, is necessary in order to understand impacts to park resources and values. Specifically, these scenarios factor into the air quality modeling analysis done in this EA. The basic methodology for developing these scenarios is unchanged from the SEIS and EIS.

A scenario was constructed for each alternative considered in detail in the draft SEIS and the final SEIS. The scenarios should be regarded as assumptions, and the same procedure is used for each alternative so that results are comparable between alternatives. Though different assumptions could be made about how use is distributed, the common computational basis allows the alternatives to be related and comparable. Use of a different computational basis would result in the same relative differences between alternatives.

An assumption made in this analysis is that the use limits prescribed by each alternative are reached each day of the peak season (January and February). At least in the short run, this is not likely to be the case. However, over time use will tend to approach the allowable limit. Since a value must be chosen for modeling purposes, the entrance limit is used as a basis for distributing visitation. Any factor that would be applied to attempt to replicate actual use in the short term – as something less than the limit – would necessarily be applied in all alternatives. Hence, the relative difference in comparing alternatives would be the same. Conceptually, the basis for setting use limits at each entrance is to reduce peak use, regarded as a causative factor in many impact assessments, and increase use at other times such that total visitation remains the same. Therefore, assuming the limit as a basis for average daily visitation to the parks appears to be the most straightforward approach.

An additional assumption was made for all alternatives that if daily snowmobile entry limits do not allow for the historic levels of snowmobile use, then the difference in visitation will be accommodated with snowcoaches. Thus, for alternatives 1- 3, snowcoach use is projected to increase relative to the historic use. It was assumed that there are 7 passengers per snowcoach.

The initial context for determining use limits is actual data on visitation, collected over the past 10 years. Visitation is shown in the next section for average daily use and for peak day use – from alternative A in the FEIS (current condition). Then, scenarios are presented for the EA alternatives in the following section, along with the alternative entrance use limits for each, and an explanation of how use was distributed.

Table 1: Quick EA alternative comparison.

Alternative Feature	Avg. Historic Condition[1]	Alt 1	Alt 2	Alt 3	Alt 4	Alt 5
Type of Oversnow Motorized Use	Snowcoach, snowmobile. Not Clean and Quiet.	Snowcoach. Mix of old and new, phase in BAT	Comparable to the winter of 03–04. Emphasizes snowcoach access while allowing some snowmobile use.	Balances snowmobile and coach access and allows unguided access. Growth would occur in snowcoach access.	Allows additional snowmobile use, but requires commercial guiding.	SEIS Alt 4. Moderate growth in snowmobile access would occur.
Daily Entrance Limits 1. YNP North 2. YNP West 3. YNP East 4. YNP South 5. YNP Old Faithful 6. GTNP East (CDST) 7. GTNP West (Grassy) 8. GTNP Jackson Lake	Snowmobiles 1. 16 2. 538 3. 35 4. 176 5. 25 6. 25 7. 25 8. 25	No limits on snowcoaches	Snowmobiles 1. 15 2. 160 3. 22 4. 121 5. 0 6. 25 7. 25 8. 0	Snowmobiles 1. 32 2. 290 3. 50 4. 146 5. 22 6. 25 7. 25 8. 25	Snowmobiles 1.30 2. 400 3. 40 4. 220 5. 30 6. 50 7. 50 8. 40	Snowmobiles 1. 20 2. 550 3. 100 4. 250 5. 30 6. 75 7. 75 8. 40
Total Daily Allowable Snowmobile Use	865 (avg. current use)	0	368	615	860	1140
Total Jan- Feb Use, snowmobile- days	51,900	0	22,080	36,900	51,600	68,400
Total Snowmobile Use	Average Use. historic level	Decrease of 100% relative to historic level	Decrease of 57.5% relative to historic level	Decrease of 29.9% relative to historic level.	Allows historic level of visitation.	Increased total use. Snowmobile use 1.32 times (132%) the historic use level
Average Daily Number of Snowcoaches Operating in YNP	18	146	87	45	18	18
Emissions Control for Snowmobiles	None	N/A	BAT	BAT	BAT	BAT
Snowmobile Guiding Requirements	None	NA	100% com'l guided	82.4% com'l guided; 17.6% unguided	100% com'l guided	80% com'l guided; 20% non-com'l guided

[1]Ref. FEIS Appendix G, page G- 2

CURRENT USE: AVERAGE DAILY AND PEAK DAY USE

NPS intent in developing alternatives for the earlier FEIS and for the Supplemental EIS has consistently been to maintain the existing level of visitation through oversnow motorized use in the three park units, which is subject in any case to limitations imposed for resource protection. NPS assumes that visitation can be maintained by implementing new technology, and by encouraging or requiring the use of snowcoach mass- transit access as opposed to individual snowmobile access. For example, the existing decision replaces individual snowmobile access with snowcoach, mass- transit access, holding visitation constant and necessitating a larger snowcoach fleet. The following tables of average daily and average peak day use represent a context in which numbers of visitors may be viewed, with the intent of maintaining those numbers through the range of alternatives. Current or existing use is reflected in FEIS alternative A.

Table 2. Yellowstone, Grand Teton, and The Parkway area road segments average daily use, January–February.

Road Segment	Segment Miles	ALTERNATIVE A CURRENT MOTORIZED USE			
		Autos	Buses/Vans	Snowcoaches	Snowmobiles
Mammoth to Northeast Entrance	47	61	4.2	0	0
Mammoth to Norris	21	0	0	3.3	30.5
West Entrance to Madison	14	0	0	9.1	554.2
Madison to Norris	14	0	0	5.2	247.0
Norris to Canyon Village	12	0	0	3.9	184.5
Canyon Village to Fishing Bridge	16	0	0	3.1	148.1
Fishing Bridge to East Entrance	27	0	0	0	36.4
Fishing Bridge to West Thumb	21	0	0	2.6	125.1
Madison to Old Faithful	16	0	0	10.3	488.6
Old Faithful to West Thumb	17	0	0	4.3	209.4
West Thumb to Flagg Ranch	24	0	0	4.3	175.8
Grassy Lake Road	8	0	0	0	24.2
Flagg Ranch to Colter Bay	16	86	9.5	0	24.3
Colter Bay to Moran Junction	10	192	10	0	24.3
Moran Junction to East Entrance	2	562	29	0	24.3
Moran Junction to South Entrance	26	773	39	0	0
Teton Park Road	15	0	0	0	10.4
Moose- Wilson Road	2	5	0	0	3
Totals	**308**	**1679**	**91.7**	**46.1**	**2310.1**

EXISTING CONDITION SCENARIO DETAILS:

1. Average daily entrance figures (Ref. FEIS Appendix G, page G- 2) for YNP: North, 16; West, 538; South, 176; East, 35. Using these average entrance figures, the average total use in YNP

on a daily basis is 765 snowmobiles.

2. Average daily use in GTNP and the Parkway is estimated at 25 snowmobiles on the CDST (east GTNP) and 25 on Grassy Lake Road (west GTNP).
3. Total average daily use in the three park units is 815.
4. Over the peak use season, January and February, total average snowmobile use in YNP is about 45,900 snowmobiles.
5. Total season use in all units is 48,900.
6. The average number of snowcoaches operating in the park each day is 18. This was calculated by dividing the average number of snowcoach passengers (11,462) by the average number of days in a winter season (90), and dividing by the average number of passengers per snowcoach (7).

Table 3. Average peak day use (based on highest use day for each year).

Road Segment	Current Condition			
	Autos	Buses/Vans	Snowcoaches	Snowmobiles
Mammoth to Northeast Entrance	107.4	8	0	0
Mammoth to Norris	0	0	6.9	40.5
West Entrance to Madison	0	0	19.0	975.4
Madison to Norris	0	0	10.9	434.7
Norris to Canyon Village	0	0	8.2	324.7
Canyon Village to Fishing Bridge	0	0	6.5	260.7
Fishing Bridge to East Entrance	0	0	0	64.1
Fishing Bridge to West Thumb	0	0	5.4	220.2
Madison to Old Faithful	0	0	21.5	859.9
Old Faithful to West Thumb	0	0	9.0	368.5
West Thumb to Flagg Ranch	0	0	9.0	376.8
Grassy Lake Road	0	0	0	42.6
Flagg Ranch to Colter Bay	151.4	16.7	0	42.8
Colter Bay to Moran Junction	337.9	17.6	0	42.8
Moran Junction to East Entrance	989.1	51.0	0	42.8
Moran Junction to South Entrance	1291.8	68.6	0	0
Teton Park Road	0	0	0	18.3
Moose- Wilson Road	8.8	0	0	5.3

Note: Figures were derived from the following sources: entrance station statistics: visitor use statistics from Visitor Services Offices of Yellowstone and Grand Teton National Park and the John D. Rockefeller, Jr., Memorial Parkway 1992- 1999. Interior road segments in Yellowstone NP and Grand Teton NP: *Social Conditions for Winter Use in Yellowstone National Park Final Report* (Borrie et. al 1997) and *Winter Use Survey Yellowstone and Grand Teton National Park and the John D. Rockefeller, Jr., Memorial Parkway* (Littlejohn 1996). Tables are reproduced from the FEIS, App. G.

MOTORIZED USE SCENARIOS FOR EACH FINAL SEIS ALTERNATIVE

ALTERNATIVE 1 SCENARIO

Usage in the 1a scenario replicates the level of current visitor use - accommodating the average daily use with access over snow roads via snowcoach only. This scenario is the same as in Alternative G from the FEIS. The emissions and sound factors associated with snowcoaches to model impacts is based on a mix of old and newer snowcoaches. This alternative assumes there would be a total of 146 snowcoaches operating in YNP each day (78 are currently authorized; historically, 18 operate in the park each day).

Table 4. Alternative 1 scenario—average daily use by road segment.

Road Segment/Area	Average Daily Vehicle Use January–February				
	Autos	Vans	Snowcoaches	Snowmobiles	Buses
Mammoth to Northeast Entrance	60	4	0	0	0
Mammoth to Norris	0	0	8	0	0
West Entrance to Madison	0	0	88	0	0
Madison to Norris	0	0	40	0	0
Norris to Canyon Village	0	0	30	0	0
Canyon Village to Fishing Bridge	0	0	24	0	0
Fishing Bridge to East Entrance	0	0	5	0	0
Fishing Bridge to West Thumb	0	0	20	0	0
Madison to Old Faithful	0	0	80	0	0
Old Faithful to West Thumb	0	0	34	0	0
West Thumb to Flagg Ranch	0	0	29	0	0
Grassy Lake Road	0	0	4	0	0
Flagg Ranch to Colter Bay	0	0	29	0	0
Colter Bay to Moran Junction	190	10	0	0	1
Moran Junction to East Entrance	560	28	0	0	2
Moran Junction to South Entrance	770	37	0	0	2
Jackson Lake Area	0	0	0	0	0
Teton Park Road	0	0	0	0	0
Moose- Wilson Road	5	0	0	0	0

ALTERNATIVES 2, 3, 4, AND 5 SCENARIOS

Usage in these scenarios is based on the following type of computation. For each park entrance there is a figure for maximum daily allowable snowmobile use - as expressed in the alternative description. From the use distribution tables in Volume 2 (Appendix A) of YNPs transportation

planning model, the percentages of snowmobile use originating at each entrance for each snow road segment may be found. For each entrance or gateway segment, the maximum allowable use (e.g. 500 at YNP West) is a percentage (.938) of the total use on the segment. With this relationship, total use on the segment may be determined by division (where x = the total use on the segment, 0.938 x = 500. Solving for x, x = 500 x 1/0.938 = 533). This calculation was performed for each gateway segment. Use on the internal segments was determined from the same set of tables in the transportation plan. For these segments, the percentage of all vehicles in the park using that segment is applied to the total maximum allowable number of snowmobiles in the park. All factors applied are shown in Table 8. Snowcoach figures were adjusted where necessary to accommodate the average daily use figures by road segment shown in Table 2.

Alternative 2 Details

1. Alternative 2 Entrance Limits:
2. YNP North = 15; YNP West = 160; YNP East = 22; YNP South = 121; YNP Old Faithful = 0; CDST (GTNP East) = 25; Grassy Lake Road (GTNP west) = 25; Jackson Lake = 0
3. Total daily allowable use in YNP = 318 snowmobiles.
4. Total allowable peak season use in YNP = 19,080
5. Total daily allowable use in the 3 park units = 368
6. Total allowable peak season use in the 3 park units = 22,080.
7. 87 snowcoaches would operate in YNP each day (78 are currently authorized).

Table 5. Alternative 2 scenario—daily use by road segment.

Road Segment/Area	Daily Vehicle Use January–February				
	Autos	Vans	Snowcoaches	Snowmobiles	Buses
Mammoth to Northeast Entrance	60	4	0	0	0
Mammoth to Norris	0	0	3	30	0
West Entrance to Madison	0	0	64	171	0
Madison to Norris	0	0	26	99	0
Norris to Canyon Village	0	0	20	73	0
Canyon Village to Fishing Bridge	0	0	16	59	0
Fishing Bridge to East Entrance	0	0	0	46	0
Fishing Bridge to West Thumb	0	0	13	50	0
Madison to Old Faithful	0	0	52	196	0
Old Faithful to West Thumb	0	0	23	82	0
West Thumb to Flagg Ranch	0	0	5	170	0
Grassy Lake Road	0	0	0	25	0
Flagg Ranch to Colter Bay	0	0	0	25	0
Colter Bay to Moran Junction	190	10	0	25	1
Moran Junction to East Entrance	560	28	0	25	2
Moran Junction to South Entrance	770	37	0	0	2
Jackson Lake Area	0	0	0	0	0
Teton Park Road	0	0	0	0	0
Moose- Wilson Road	5	0	0	0	0

Alternative 3 Scenario details:

1. Alternative 3 Entrance Limits:
2. YNP North = 32; YNP West = 290; YNP East = 50; YNP South = 146; YNP Old Faithful = 22; CDST (GTNP East) = 25; Grassy Lake Road (GTNP west) = 25; Jackson Lake = 25
3. Total daily allowable use in YNP = 540 snowmobiles.
4. Total allowable peak season use in YNP = 32,400
5. Total daily allowable use in the 3 park units = 615
6. Total allowable peak season use in the 3 park units = 36,900.
7. 45 snowcoaches would operate in YNP each day, but could be as many as 78, which are authorized by current concessions contracts. .

Table 6. Alternative 3 scenario.

Road Segment	Daily Vehicle Use January–February				
	Autos	Vans	Snowcoaches	Snowmobiles	Buses
Mammoth to Northeast Entrance	60	4	0	0	0
Mammoth to Norris	0	0	3	63	0
West Entrance to Madison	0	0	44	310	0
Madison to Norris	0	0	16	168	0
Norris to Canyon Village	0	0	12	125	0
Canyon Village to Fishing Bridge	0	0	10	101	0
Fishing Bridge to East Entrance	0	0	0	106	0
Fishing Bridge to West Thumb	0	0	8	85	0
Madison to Old Faithful	0	0	33	333	0
Old Faithful to West Thumb	0	0	14	140	0
West Thumb to Flagg Ranch	0	0	4	206	0
Grassy Lake Road	0	0	0	25	0
Flagg Ranch to Colter Bay	0	0	0	25	0
Colter Bay to Moran Junction	190	10	0	25	1
Moran Junction to East Entrance	560	28	0	25	2
Moran Junction to South Entrance	770	37	0	0	2
Jackson Lake Area	0	0	0	25	0
Teton Park Road	0	0	0	0	0
Moose- Wilson Road	5	0	0	0	0

Alternative 4 Details:

1. Alternative 4 Entrance Limits:
2. YNP North = 30; YNP West = 400; YNP East = 40; YNP South = 220; YNP Old Faithful = 30; CDST (GTNP East) = 50; Grassy Lake Road (GTNP west) = 50; Jackson Lake = 40
3. Total daily allowable use in YNP = 720 snowmobiles.
4. Total allowable peak season use in YNP = 43,200
5. Total daily allowable use in the 3 park units = 860
6. Total allowable peak season use in the 3 park units = 51,600.
7. 18 snowcoaches would operate in YNP each day but could be as many as 78, which are authorized by current concessions contracts.

Table 7. Alternative 4 scenario.

Road Segment	Daily Vehicle Use January–February				
	Autos	Vans	Snowcoaches	Snowmobiles	Buses
Mammoth to Northeast Entrance	60	4	0	0	0
Mammoth to Norris	0	0	3	59	0
West Entrance to Madison	0	0	27	428	0
Madison to Norris	0	0	8	225	0
Norris to Canyon Village	0	0	7	166	0
Canyon Village to Fishing Bridge	0	0	5	135	0
Fishing Bridge to East Entrance	0	0	0	84	0
Fishing Bridge to West Thumb	0	0	4	114	0
Madison to Old Faithful	0	0	17	444	0
Old Faithful to West Thumb	0	0	8	186	0
West Thumb to Flagg Ranch	0	0	4	310	0
Grassy Lake Road	0	0	0	50	0
Flagg Ranch to Colter Bay	0	0	0	50	0
Colter Bay to Moran Junction	190	10	0	50	1
Moran Junction to East Entrance	560	28	0	50	2
Moran Junction to South Entrance	770	37	0	0	2
Jackson Lake Area	0	0	0	40	0
Teton Park Road	0	0	0	0	0
Moose- Wilson Road	5	0	0	0	0
Antelope Flats Route	0	0	0	0	0

Alternative 5 Details:

1. Alternative 5 Entrance Limits:
2. YNP North = 20; YNP West = 550; YNP East = 100; YNP South = 250; YNP Old Faithful = 30; CDST (GTNP East) = 50; Grassy Lake Road (GTNP west) = 50; Jackson Lake = 40
3. Total daily allowable use in YNP = 950 snowmobiles.
4. Total allowable peak season use in YNP = 57,000
5. Total daily allowable use in the 3 park units = 1,140
6. Total allowable peak season use in the 3 park units = 68,400.
7. 18 snowcoaches would operate in YNP each day, but could be as many as 78, which are authorized by current concessions contracts.

Table 8. Alternative 5 scenario.

Road Segment	Daily Vehicle Use January–February				
	Autos	Vans	Snowcoaches	Snowmobiles	Buses
Mammoth to Northeast Entrance	60	4	0	0	0
Mammoth to Norris	0	0	3	40	0
West Entrance to Madison	0	0	9	589	0
Madison to Norris	0	0	5	296	0
Norris to Canyon Village	0	0	4	219	0
Canyon Village to Fishing Bridge	0	0	3	178	0
Fishing Bridge to East Entrance	0	0	0	211	0
Fishing Bridge to West Thumb	0	0	3	150	0
Madison to Old Faithful	0	0	10	586	0
Old Faithful to West Thumb	0	0	4	246	0
West Thumb to Flagg Ranch	0	0	4	353	0
Grassy Lake Road	0	0	0	75	0
Flagg Ranch to Colter Bay	0	0	0	75	0
Colter Bay to Moran Junction	190	10	0	75	1
Moran Junction to East Entrance	560	28	0	75	2
Moran Junction to South Entrance	770	37	0	0	2
Jackson Lake Area	0	0	0	40	0
Teton Park Road	0	0	0	0	0
Moose- Wilson Road	5	0	0	0	0
Antelope Flats Route	0	0	0	0	0

SUPPLEMENTAL TABLES

Table 9. Factors used to distribute use within the parks based on entrance limits in each alternative.

ROAD SEGMENT/AREA	% of total daily use on segment,[1] applied to total allowable use for each alternative.	% factor applied to allowable use at each entrance to estimate use on entrance segment.[2]
Mammoth to Norris	NA	1/0.505 = 1.98
West Entrance to Madison	NA	1/0.938 = 1.07
Madison to Norris	0.312	NA
Norris to Canyon Village	0.231	NA
Canyon Village to Fishing Bridge	0.187	NA
Fishing Bridge to East Entrance	NA	1/0.475 = 2.11
Fishing Bridge to West Thumb	0.158	NA
Madison to Old Faithful	0.617	NA
Old Faithful to West Thumb	0.259	NA
West Thumb to Flagg Ranch	NA	1/0.711 = 1.41
Grassy Lake Road	NA	1.00
Flagg Ranch to Colter Bay	NA	1.00
Colter Bay to Moran Junction	NA	1.00
Moran Junction to East Entrance	NA	1.00
Jackson Lake Area	NA	NA

[1]Ref. Yellowstone National Park Transportation Plan, Volume 2, Appendix A, Use distribution tables.

[2]The factors 0.505, 0.938, 0.475, and 0.711 are derived from the referenced transportation plan, conveying the idea that the number of snowmobiles coming in at each entrance is less than the number of snowmobiles traveling on the respective gateway road segment during the day. The factors, expressed as use on the gateway road segment, are adjusted from percentage use on each segment, re- entry rate estimates, and judgment as reviewed and agreed by Kim Raap, former Wyoming State Trails Coordinator. In the use calculation shown in the narratives for each scenario, use on each gateway segment is the objective function. In solving the equation for use, it is necessary and expedient to show, in this table, the factor from the transportation plan (entrance number as a percentage of use on the segment) as an inverse (the ratio of amount of use on the segment to the number allowed in at the entrance). In this manner, the allowable use number can be multiplied directly by the ratio to obtain the amount of use on the gateway segment in each scenario.

Table 10: Oversnow vehicle miles traveled, by alternative, by road segment.

Road Segments	Segment Miles	Current Condition		Alt 1	Alt 2		Alt 3		Alt 4		Alt 5	
		Coach	Snowmobile	Coach	Coach	Snowmobile	Coach	Snowmobile	Coach	Snowmobile	Coach	Snowmobile
Mammoth to Norris	21	69	641	168	63	630	63	1323	63	1239	63	840
West Entrance to Madison	14	127	7759	1232	896	2394	616	4340	378	5992	126	589
Madison to Norris	14	73	3458	560	364	1386	224	2352	112	3150	70	8246
Norris to Canyon Village	12	47	2214	360	240	876	144	1500	84	1992	48	4144
Canyon Village to Fishing Bridge	16	50	2370	384	256	944	160	1616	80	2160	48	2628
Fishing Bridge to East Entrance	27	0	983	135	0	1242	0	2862	0	2268	0	5697
Fishing Bridge to West Thumb	21	55	2627	420	273	1050	168	1785	84	2394	63	3150
Madison to Old Faithful	16	165	7818	1280	832	3136	528	5328	272	7104	160	9376
Old Faithful to West Thumb	17	73	3560	578	391	1394	238	2380	136	3162	68	4182
West Thumb to Flagg Ranch	24	103	4219	696	120	4080	96	4944	96	7440	96	8472
Grassy Lake Road	8	0	184	32		200	0	200	0	400	0	600
Flagg Ranch to Colter Bay	16	0	379	464		400	0	400	0	800	0	1200
Colter Bay to Moran Junction	10	0	248	0		250	0	250	0	500	0	750
Moran Junction to East Entrance	2	0	49	0		50	0	50	0	100	0	150
Totals	**218**	**762**	**36,509**	**6,309**	**3,435**	**18,032**	**2,237**	**29,330**	**1,305**	**38,701**	**742**	**50,024**

APPENDIX B
MONITORING AND ADAPTIVE MANAGEMENT

Table 1. Monitoring and adaptive management indicators, thresholds, and methods.

Resource or Value	Indicator	Location/ Management Zone	Preliminary Threshold	Preliminary Method	Initial Monitoring Intensity*	Possible Management Options if Threshold is Violated
Air Quality	Park employees and visitors exposure to CO, particulate matter, and volatile organic compounds	Zone 1	1- hr maximum CO (w/bkgd): 8 ppm 8- hr maximum CO (w/bkgd): 3 ppm 24- hr maximum PM_{10} (w/bkgd): 23 g/m^3 No observed employee health problems due to air quality ATSDR (Agency for Toxic Substances and Disease Registry) Minimal Risk Levels	Fixed site monitoring or personal sampling for PM and CO Personal samples, cartridges, or canisters for VOCs (air toxics)	High	▪ Require new technologies ▪ Adjust number of daily vehicle entries permitted ▪ Establish timed-entry requirements
		Zone 2	1- hr maximum CO (w/bkgd): 1 ppm 8- hr maximum CO (w/bkgd): 1 ppm 24- hr maximum PM_{10}: 5 g/m^3 No observed employee health problems due to air quality ATSDR (Agency for Toxic Substances and Disease Registry) Minimal Risk Levels	Fixed site monitoring or personal sampling for PM and CO Personal samples, cartridges, or canisters for VOCs (air toxics)	Low	
		Zone 3	1- hr maximum CO (w/bkgd): 1 ppm 8- hr maximum CO (w/bkgd): 1 ppm 24- hr maximum PM_{10} (w/bkgd): 6 g/m^3 No observed employee health problems due to air quality ATSDR (Agency for Toxic Substances and Disease Registry) Minimal Risk Levels	Fixed site monitoring or personal sampling for PM and CO Personal samples, cartridges, or canisters for VOCs (air toxics)	Moderate	

Resource or Value	Indicator	Location/ Management Zone	Preliminary Threshold	Preliminary Method	Initial Monitoring Intensity*	Possible Management Options if Threshold is Violated
		Zones 4–5	1- hr maximum CO (w/bkgd): 1 ppm 8- hr maximum CO (w/bkgd): 1 ppm 24- hr maximum PM_{10}: 5 g/m^3	Fixed site monitoring or personal sampling for PM and CO	Low	
	Visibility	Zones 1–4	No perceptible localized visibility impacts	Photo Survey and time laps video and nephelometer	High	
		Zones 5–9	No perceptible localized visibility impacts		Low	
	Odor	Zones 1–3	Area free of any noticeable odor resulting from motorized recreation at least 90% of the daytime hours of park operation (8 A.M.– 4 P.M.)	Park visitor survey Scentometer	High	
		Zones 4–5	Area free of any noticeable odor resulting from motorized recreation at least 95% of the daytime hours of park operation (8 A.M.– 4 P.M.)		Low	
		Zones 6–9	Area free of any noticeable odor resulting from motorized recreation		Low	

Resource or Value	Indicator	Location/ Management Zone	Preliminary Threshold	Preliminary Method	Initial Monitoring Intensity*	Possible Management Options if Threshold is Violated
Natural Soundscapes	Distance and time human-caused sound is audible	Zones 1–5	During daytime hours of park operation (8 A.M.– 4 P.M.) and measured 100 feet from staging areas and roadways: ▪ Audibility: Not to exceed (NTE) 50% ▪ dB of human caused noise: NTE 70 dB(A) ▪ Leq (average sound level): NTE 45 dB(A) Note: Audibility is the percent of time oversnow vehicles are audible to a person with normal hearing. A NTE 50% threshold means that oversnow vehicles will not be audible more than 50% of the time during daytime hours of park operation.	Audibility logging, digital recordings, and sound pressure level measurement	High	▪ Require new technologies ▪ Adjust number of daily vehicle entries permitted ▪ Establish timed-entry requirements
		Zone 6	During daytime hours of park operation (8 A.M.– 4 P.M.) and measured 100 feet from staging areas and roadways: ▪ Audibility: Not to exceed (NTE) 25% ▪ dB of human caused noise: NTE 70 dB(A) ▪ Leq (average sound level): NTE 45 dB(A)		High	

Resource or Value	**Indicator**	**Location/ Management Zone**	**Preliminary Threshold**	**Preliminary Method**	**Initial Monitoring Intensity***	**Possible Management Options if Threshold is Violated**
		Zones 7–8	During daytime hours of park operation (8 A.M.– 4 P.M.) and measured 100 feet from staging areas and roadways: ▪ Audibility: Not to exceed (NTE) 20% ▪ dB of human caused noise: NTE 6 dB(A) below natural ambient sound levels ▪ Leq (average sound level): NTE natural ambient sound levels Note: Vehicle noise, even at 6 dB(A) less than natural ambient, is usually audible due to the lower frequencies of human-caused noise. Additionally, since natural and human- caused sounds tend to be in different frequencies, both can be audible at the same time, even at very low levels.		Moderate	
Safety	Motor vehicle accidents	Zones 1–5	Continual improvement of three- year sliding average	Incident descriptions and GIS mapping	High	▪ Alter or implement commercial and non- commercial guiding requirements and/or ratio ▪ Increase signage and reduce speed limits in areas of recurring incidents ▪ Increase law enforcement and educational information ▪ Adjust number of daily vehicle entries permitted

Resource or Value	Indicator	Location/ Management Zone	Preliminary Threshold	Preliminary Method	Initial Monitoring Intensity*	Possible Management Options if Threshold is Violated
Water/Snowpack	Water quality: VOCs, pH, hydrogen, ammonium, calcium, sulfate, nitrate, and NOx	Zones 1–3	Monitoring will occur until BAT requirements are full implemented and a longer- term threshold will be set then. In the interim, the following thresholds will be used:† ▪ Benzene: EPA maximum limit for drinking water 0.005 mg/L. OSHA permissible exposure in workplace (8 hour day, 40 hour weeks) 1 ppm ▪ Toluene: EPA maximum limit for drinking water 1 mg/L. OSHA permissible exposure in workplace 200 ppm ▪ Ethylbenzene: EPA maximum limit for drinking water .7 mg/L. OSHA permissible exposure in workplace 100 ppm ▪ Xylene: EPA maximum limit for drinking water 10 ppm. OSHA permissible exposure in workplace 100 ppm	Snowpack sampling, snowmelt runoff, stream runoff, snowmelt/rain event	Moderate	▪ Require new technologies ▪ Determination and application of best management practices ▪ Adjust number of daily vehicle entries permitted
		Zone 8	▪ Benzene: EPA maximum limit for drinking water 0.005 mg/L. OSHA permissible exposure in workplace (8 hour day, 40 hour weeks) 1 ppm ▪ Toluene: EPA maximum limit for drinking water 1 mg/L. OSHA permissible exposure in workplace 200 ppm ▪ Ethylbenzene: EPA maximum limit for drinking water .7 mg/L. OSHA permissible exposure in workplace 100 ppm ▪ Xylene: EPA maximum limit for drinking water 10 ppm. OSHA permissible exposure in workplace 100 ppm	Snowpack sampling, snowmelt runoff, stream runoff, snowmelt/rain event	Low	
Geothermal Features	Human- caused damage to geothermal areas	Zone 1	No degradation of geothermal resources	Remote sensing and visual observation	High	▪ Increase law enforcement and educational information ▪ Restrict travel

Resource or Value	Indicator	Location/ Management Zone	Preliminary Threshold	Preliminary Method	Initial Monitoring Intensity*	Possible Management Options if Threshold is Violated
Visitor Experience	Smoothness of the groomed surface	Zone 3	No worse than fair 20% of the daytime hours of park operation (8 A.M.– 4 P.M.)	Visual observation	High	▪ Increase grooming ▪ Adjust vehicle numbers when threshold temperature and/or snow conditions are forecasted or reached
		Zone 4	No worse than fair 20% of the daytime hours of park operation (8 A.M.– 4 P.M.)		Low	
	Visitor satisfaction levels with opportunities to experience and view wildlife, scenery, and clean air and solitude.	Zones 1- 8	Visitors are highly satisfied (+90%) with their park experience		High	▪ Establish carrying capacity/adjust visitor numbers ▪ Determine unsatisfactory conditions and rectify
	Visitor perception assessment of important park resources and values	Zones 1- 8	Visitors are able to see, smell, and hear the natural environment at roadside pullouts and interpretive trails 90% of each 24- hour period	Visitor survey Encounter rates Time lapse photos Travel simulation models Observations	High	▪ Establish carrying capacity/adjust visitor numbers ▪ Require new technologies

[†]Ingersoll (1999) compared his water quality findings for snowmelt runoff to drinking water standards.

Resource or Value	Indicator	Location/ Management Zone	Preliminary Threshold	Preliminary Method	Initial Monitoring Intensity*	Possible Management Options if Threshold is Violated
Wildlife	Bird and mammal habituation and effectiveness of garbage facilities	Zone 1	Garbage unavailable to wildlife	Photo surveys and observations	High	▪ Improve or redesign facilities ▪ Adjust number of daily vehicle entries permitted ▪ Alter or implement commercial guiding requirements and allocations
	Ungulate (e.g., bison and elk) movements on plowed roads	Zone 2	No unacceptable adverse effects. Unacceptable effects are those considered greater than "adverse negligible." See Chapter IV, *Wildlife*, for definitions of effects.	Continue bison monitoring, flights, and photo surveys	High	▪ Evaluate alternative transportation systems ▪ Close roads (by road segment or seasonally)
	Vehicle caused wildlife mortality	Zones 2- 4	No unacceptable adverse effects	Incident reports, roadside surveys, GIS, and visual observations	High	▪ Alter or implement commercial guiding requirements and allocations ▪ Evaluate alternative transportation systems ▪ Increase law enforcement and educational information ▪ Reduce speed limits

Resource or Value	Indicator	Location/ Management Zone	Preliminary Threshold	Preliminary Method	Initial Monitoring Intensity*	Possible Management Options if Threshold is Violated
	Wildlife harassment or displacement due to vehicle sounds or movements	Zone 2–5	No unacceptable adverse effects	Incident reports, photo surveys, and visual observations	High	▪ Increase law enforcement and educational information ▪ Require new technologies ▪ Adjust number of daily vehicle entries permitted ▪ Alter or implement commercial guiding requirements and allocations ▪ Establish additional no- stopping zones ▪ Adjust group size requirements ▪ Establish timed- entry requirements ▪ Close roads (by road segment or seasonally)
	Wildlife trapped by snow berms in road corridor	Zone 2	No unacceptable adverse effects	Incident reports, roadside surveys, and visual observations	High	▪ Increase number of exit berms and re-evaluate location of existing exits ▪ Evaluate alternative transportation systems
	Ungulate (e.g., bison and elk) use of groomed surfaces	Zones 3–4	No unacceptable adverse effects	Visual observations, photo surveys, air surveys, and telemetry. Continue bison monitoring	High	▪ Close roads or eliminate grooming operations (by road segment or seasonally) ▪ Adjust grooming intensity

Resource or Value	Indicator	Location/ Management Zone	Preliminary Threshold	Preliminary Method	Initial Monitoring Intensity*	Possible Management Options if Threshold is Violated
	Carnivore (e.g., wolves and lynx) displacement and habitat effectiveness	Zones 3–9	Insignificant, discountable, or beneficial effects only	Carnivore and snowshoe hare track surveys and air surveys	High	▪ Mitigate effects or close area ▪ Increase law enforcement and educational information ▪ Require new technologies ▪ Adjust number of daily vehicle entries permitted ▪ Alter or implement commercial guiding requirements and allocations ▪ Establish additional no- stopping zones ▪ Adjust group size requirements ▪ Establish timed- entry requirements ▪ Consult with USFWS for appropriate mitigation strategies
	Wildlife harassment or displacement as a result of visitor activities	Zone 6–9	No unacceptable adverse effects	Incident reports, photo surveys, and visual observations	High	▪ Increase law enforcement and educational information ▪ Require use of designated trails only ▪ Close areas to use seasonally
	Human- bear conflicts during pre- and post-denning periods	Zones 2 and 7–9	No unacceptable adverse effects	Mapping of denning areas and visitor use patterns and trends. Incident Reports	Moderate	

APPENDIX C
PUBLIC SCOPING COMMENT SUMMARY

Temporary Winter Use Plans Environmental Assessment for Yellowstone and Grand Teton National Parks and the John D. Rockefeller, Jr., Memorial Parkway

NATIONAL PARK SERVICE

North Wind, Inc. (North Wind) was contracted by the NPS to collect and analyze public scoping comments for the EA. This was accomplished by designing and maintaining a World Wide Web- based interface through which public comments could be collected. Members of the public also sent paper comment letters directly to the NPS, which forwarded them to North Wind for processing.

North Wind received 15,083 documents commenting on the scope of the EA, including 13,637 in electronic form and 1,446 in hard copy. Following are two tables summarizing 1) the Number of Commentors and Letters from Each State; and 2) the Number of Commentors Who Expressed Each Comment.

NUMBER OF COMMENTORS AND LETTERS FROM EACH STATE

State	Number of Letters Number of Commentors %Total Commentors
AE	
	0
	0
	0.00
AK	
	37
	36
	0.25
AL	
	61
	59
	0.41
AP	
	1
	1
	0.01
AR	
	61
	59
	0.41

State	Number of Letters Number of Commentors %Total Commentors
AZ	
	290
	280
	1.92
CA	
	2,661
	2,566
	17.63
CO	
	531
	515
	3.54
CT	
	185
	180
	1.24
DC	
	34
	34
	0.23

State	Number of Letters Number of Commentors %Total Commentors
DE	
	35
	33
	0.23
FL	
	782
	748
	5.14
GA	
	234
	224
	1.54
GU	
	0
	0
	0.00
HI	
	73
	68
	0.47
IA	
	106
	102
	0.70
ID	
	330
	324
	2.23
IL	
	585
	563
	3.87
IN	
	173
	164
	1.13
KS	
	109
	104
	0.71
KY	
	106
	102
	0.70
LA	
	77
	71
	0.49
MA	
	393
	388
	2.67

State	Number of Letters Number of Commentors %Total Commentors
MD	
	226
	216
	1.48
ME	
	133
	127
	0.87
MI	
	464
	441
	3.03
MN	
	289
	280
	1.92
MO	
	246
	239
	1.64
MS	
	32
	31
	0.21
MT	
	557
	534
	3.67
NC	
	289
	282
	1.94
ND	
	9
	9
	0.06
NE	
	39
	39
	0.27
NH	
	125
	123
	0.85
NJ	
	306
	294
	2.02
NM	
	127
	120
	0.82

State	Number of Letters Number of Commentors %Total Commentors
NV	
	101
	94
	0.65
NY	
	944
	918
	6.31
OH	
	428
	410
	2.82
OK	
	58
	54
	0.37
OR	
	432
	422
	2.90
PA	
	474
	456
	3.13
PR	
	4
	4
	0.03
RI	
	56
	56
	0.38
SC	
	110
	104
	0.71
SD	
	33
	30
	0.21
TN	
	176
	171
	1.18
TX	
	666
	636
	4.37
UT	
	158
	151
	1.04
VA	
	297
	290
	1.99
VI	
	0
	0
	0.00
VT	
	79
	77
	0.53
WA	
	621
	598
	4.11
WI	
	299
	291
	2.00
WV	
	44
	43
	0.30
WY	
	335
	332
	2.28
OTHER	
	61
	60
	0.41
Totals	
	15,082
	14,553
	100.00

NUMBER OF COMMENTS WHO EXPRESSED EACH COMMENT

Comment ID
Comment
Number of Distinct Commentors

1
Commentors question, with reasonable basis, the accuracy of information related to development of a temporary winter use plan.

1.1
Commentors question whether or not the public and NPS have access to accurate information about impacts to support decisionmaking. Some commentors recommend providing public access (such as by a web page) to factual information such as: miles of groomed trails, speed limits, enforcement data, snowmachine visitations per year, noise impacts compared to other kinds of vehicles, socioeconomic impacts.

10

1.1.1
Commentors support continuing or increasing research, monitoring, and education to ensure that the public and NPS have the information needed to support sound policymaking. Some commentors add specific research needs including:
* Snowcoach safety
* Snowcoach visitor experience
* Snowcoach emissions testing.

21

1.1.2
Commentors request that the EA include information about the full range of alternatives and impacts and additional information so the public can see that the analysis is balanced. Some commentors request considering the following:
* Specific studies relating to the impacts of road grooming and snowmobile use.
* Specific, existing emissions and sound research showing that BAT technology reduces environmental impacts.
* Specific, existing studies addressing snowcoach impacts.
* Specific, existing studies on the impacts of road grooming to wildlife.
* Relative effects of mild vs. severe winters.
* Measurement of noise at peak traffic times.

13

1.2
Commentors state that NPS needs better, more accurate data showing that 4- stroke- engine snowmobiles (compared to 2- stroke machines) actually reduce winter pollution. Some commentors add that tests were never done; others request that the EA address these relative impacts as well as the percentage of cumulative impacts caused by snowmobiles.

13

1.3
Commentors question the validity of data provided by NPS. Some commentors question the professionalism and/or integrity of NPS and its impact on data validity. Some commentors express doubt that NPS can either commission or conduct "best science" research.

10

1.3.1
Commentors question the validity and application of data regarding the 2003/2004 season. Some commentors request clarification of items such as:
* The impacts of federal court decisions on visitation numbers.
* Use of visitation numbers as a basis for changing snowmobile limits. 7

Comment ID
Comment
Number of Distinct Commentors

2
Commentors question, with reasonable basis, the adequacy of environmental analysis related to development of a temporary winter use plan.

2.1
Commentors question the validity of existing environmental analysis. Some commentors add that the analyses do not make it clear that banning snowmobiles would benefit the parks or whether it would justify the loss of access.
4

2.2
Commentors state that analysis of data in previous NEPA documents show that the parks can accommodate a full range of winter use activities without compromising the NPS mission; commentors request that the EA proceed from this premise.
2

3
Commentors present additional alternatives that the EA should consider.

3.1
No restrictions on snowmobile use.
13

3.2
Allow access by automobiles in the winter. Some commentors recommend that NPS keep roads plowed in winter for this purpose.
8

3.3
Ban all snowmobile and off- road vehicle use at all national parks forever.
135

3.4
Allow snowplane access to Jackson Lake for fishing. Some commentors add that
* Snowplanes can meet acceptable noise levels
* Eliminating snowplane access is discriminatory, especially to the elderly and handicapped
* There are few other uses for Jackson Lake in the winter.
785

3.5
Ban all vehicles from Yellowstone.
24

3.6
Allow a mix of snowmobiles and snowcoaches rather than a snowcoach- only alternative.
6

3.7
Add at least one alternative that allows unguided access to the parks for those who have completed a safety training program.
2

Comment ID
Comment
Number of Distinct Commentors

4
Commentors provide information that may cause changes or revisions to a proposed temporary winter use plan.

4.1
Commentors identify additional actions that should be included in the scope of the EA.
5

4.2
Commentors request that the scope of the EA address the impacts to the environment of human waste left by cross country skiers (year round); these impacts could surpass those of snowmobiles.
8

5
Commentors state a preference for one of the alternatives that the EA will examine.

5.1
Commentors state a preference for an alternative that allows only snowcoaches and/or prohibits snowmobiles. Some commentors would except emergency or park use of snowmobiles.
13,093

5.1.1
Commentors make statements about potential mitigation measures that NPS might employ for the two- winter period.
0

5.1.1.1
Daily limits
5

5.1.1.2
Technology requirements (BAT)
4

5.1.1.2.1
Commentors claim that snowcoaches are a better option because snowmobiles with BAT improvements are not sufficiently protective of the parks.
5,622

5.1.1.2.2
Commentors request that NPS consider snowcoach impacts in the EA, as well as a requirement for BAT technology on snowcoaches.
6

5.1.1.3
Guiding requirements and implementation
1

5.1.1.4
Commentors suggest other mitigative measures for snowcoaches:
* Snowcoach operations should be carefully regulated and licensed to ensure protection of the parks
* Reduce the size of snowcoaches.
2

Comment ID
Comment
Number of Distinct Commentors

5.1.1.5
Visitor distribution: restrictions on specific trails or routes.
1

5.1.1.5.1
Consider closing selected snowcoach routes and eliminating grooming, as well as the relative environmental and cost benefits of these closures. Suggested routes for closure include the east entrance and the Canyon to West Thumb road, which both have few visitors in winter.
1

5.1.1.5.2
Consider expanding the number of routes to spread out use by snowcoaches.
1

5.1.2
Commentors encourage NPS to increase permits for snowcoaches to keep attendance up in the parks. Some commentors recommend
* Replacing the number of snowcoach seats lost last winter
* Replacing each snowmobile lost to quotas with two new snowcoach seats.
21

5.1.3
Commentors claim various advantages for a snowcoach- only alternative.
5,604

5.1.3.1
Commentors claim that the American public overwhelming supports the snowcoach- only alternative (as in the 2001 Winter Use Plan) as illustrated in previous public comment opportunities on this issue.
7,424

5.1.3.2
Commentors claim that snowcoach- only access would provide the best balance of positive benefits versus negative impacts.
12,804

5.1.3.3
Commentors claim that snowcoach- only access is easier and cheaper to manage than snowmobile access as well as easier and cheaper for the visitor.
4

5.1.3.4
Commentors claim that snowcoach- only access will provide full motorized access to the parks and support visitation targets.
5,919

5.1.3.5
Commentors claim that snowcoach- only access will provide economic certainty for gateway communities.
12,473

5.1.3.6
Commentors state that group transit options such as snowcoaches are used successfully at other national parks such as Denali.
13

Comment ID
Comment
Number of Distinct Commentors

5.1.4
Commentors state that NPS can and should improve the current process for procuring snowcoach services to enable them to support historic visitation levels. Some commentors request that NPS change its procurement practices as follows:
* Grant more snowcoach contracts to a variety of vendors
* Be more receptive to proposals for new snowcoach recreational opportunities

19

5.2
Commentors state a preference for an alternative that allows managed snowmobile use. Some commentors add that the December 2003 Winter Use Plan was balanced and a good compromise.

956

5.2.1
Commentors make statements about potential mitigation measures and/or snowmobile management techniques that the EA will examine.

2

5.2.1.1
Daily limits

20

5.2.1.1.1
Allow the maximum number of snowmobiles daily (950 for Yellowstone/140 for GTNP) or increase daily limits (up to 2000 for Yellowstone/500 for GTNP). Some commentors add that limits should increase as snowmobile technology improves.

792

5.2.1.1.2
Allow the minimum number of snowmobiles (500 for Yellowstone/50 for GTNP) or lower daily limits. Some commentors recommend very limited use of BAT machines and those used by the park for utilitarian/maintenance purposes.

300

5.2.1.1.3
Other comments relating to limits such as:
* General support for limits.
* Limit day trips but do not count overnight trips.
* Reallocate portions of entry limits for the north and east entrances to west and south entrances.

57

5.2.1.2
Technology requirements (BAT)

41

5.2.1.2.1
Commentors support allowing only snowmobiles with BAT to operate in the park. Some commentors add that use of BAT machines resulted in a better winter experience during the winter of 2003- 2004.

1,014

Comment ID
Comment
Number of Distinct Commentors

5.2.1.2.2
Commentors support allowing non- BAT or privately owned machines to operate in the park and/or discounting entrance fees for BAT machines. Some commentors recommend various mitigative measures for non- BAT machines including requirements such as:
* Mandatory inspection before entry
* Proof that machines are less than 15 years old and in good working order
* Allowing noncompliant machines to enter only on certain days.

25

5.2.1.2.3
Commentors request that all snowmobiles be required to meet Federal Clean Air standards in order to enter the park.
2

5.2.1.3
Guiding requirements and implementation

17

5.2.1.3.1
Allow guided machines only.

69

5.2.1.3.2
Allow a percentage of non- guided and/or non- commercially guided machines (up to 50 percent of the total). Some commentors add that guide requirements are an unfair restriction and/or cost burden and reduce overall visitation levels. Some commentors recommend various mitigative measures to enable unguided access, including:
* Install better trail signs
* Provide visitor training/education and allow self- guided access if individuals pass a test
* Allow local residents self- guided access
* Allow unguided access for BAT machines

1,096

5.2.1.3.3
Commentors object that the current process for procuring guide services is unfair, monopolistic, overly complicated, and drives up costs because only eight vendors hold contracts. Commentors make various suggestions relating to contracting:
* Allow more guide contracts and permits.
* Allow other companies to provide guides under conditional use permits.

268

5.2.2
Commentors suggest other mitigation measures and/or snowmobile management techniques that the EA should examine.

2

5.2.2.1
Establish and enforce stiff penalties for rule violations including speeding and wildlife right of way.

27

5.2.2.2
Improve distribution of snowmobile permits.

2

5.2.2.2.1
Use a lottery system to distribute entry passes. 1

Comment ID Comment Number of Distinct Commentors	
5.2.2.2.2 Make snowmobile passes available by mail, over the Internet, or at local businesses near the park.	10
5.2.2.3 Require speed governors on snowmobiles that enter the parks.	8
5.2.2.3.1 Commentors recommend that the speed limit from West Yellowstone to Old Faithful be 45 miles per hour.	1
5.2.2.4 Visitor distribution: restrictions on specific trails or routes.	14
5.2.2.4.1 Allow snowmobile access to Jackson Lake for fishing.	787
5.2.2.4.2 Allow snowmobile use on the Continental Divide Snowmobile Trail and Grassy Lake Road, including access for commercial snowmobile outfitters/guides. Some commentors add that this trail should be exempted from BAT and permit requirements because there is no park entrance station for enforcement.	774
5.2.2.4.3 Allow snowmobile operation in the Cave Falls area.	2
5.2.2.4.4 Allow snowmobiles to operate on all historic groomed roads and loop trails including those to scenic points of interest.	776
5.2.2.4.5 Commentors request snowmobile access to Firehole Canyon, Grand Canyon and Virginia Cascades.	6
5.2.2.4.6 Consider closing selected snowmobile routes and eliminating grooming, as well as the relative environmental and cost benefits of these closures. Suggested routes for closure include the east entrance and the Canyon to West Thumb road, which both have few visitors in winter.	2
5.2.2.4.7 Consider expanding the number of routes to spread out use by snowmachines.	3
5.2.2.5 Stagger group entry times to reduce snowmobile crowding at park entrances.	3

Comment ID
Comment
Number of Distinct Commentors

5.2.2.6
Commentors request that the EA address adaptive management and/or monitoring strategies. Some commentors add that this should include increasing snowmobiles limits as technologies improve.
11

5.2.2.7
Extend the snowmobile season from mid- December to mid- March.
2

5.2.2.8
Require all snowmobile operators to have a valid public drivers license.
2

5.2.2.9
Limit snowmobile travel to daylight hours.
1

5.2.3
Commentors claim various advantages for an alternative that allows managed snowmobile access.
2

5.2.3.1
Commentors claim that snowmobile access to the parks provides more flexibility and a better experience for visitors.
23

5.2.3.2
Commentors claim that snowmobiling in the parks promotes family values.
14

5.2.3.3
Commentors claim that snowmobiles are a solution to park funding shortages; entrance fees generate revenues that exceed the costs of managing them.
1

5.2.3.4
Commentors claim that the American public overwhelming prefers snowmobile access to the parks.
1

6
Commentors make statements regarding the potential impacts of snowcoach use on park resources and values that the EA will consider.

6.1
Commentors state concerns about the impacts from snowcoaches on park resources/values. Some commentors add that their impacts are greater than those of snowmobiles with BAT technology.
645

6.1.1
Air quality
21

6.1.2
Soundscapes
17

Comment ID Comment Number of Distinct Commentors	
6.1.3 Visitor experience	25
6.1.4 Employee and visitor health and safety	17
6.1.5 Wildlife	16
6.2 Commentors deny that snowcoaches have negative impacts on park resources/values.	17
6.2.1 Air quality	12
6.2.2 Soundscapes	21
6.2.3 Visitor experience	25
6.2.4 Employee and visitor health and safety	20
6.2.5 Wildlife	23
7 **Commentors make statements regarding the potential impacts of snowmobile use on park resources and values that the EA will consider.**	
7.1 Commentors state concerns about the impacts from snowmobiles on park resources/values. Some commentors add that even BAT snowmobiles do not provide sufficient protection.	6,960
7.1.1 Air quality	6,902
7.1.2 Soundscapes	6,675

Comment ID Comment Number of Distinct Commentors	
7.1.3 Visitor experience	879
7.1.4 Employee and visitor health and safety	6,262
7.1.5 Wildlife: Commentors express concerns about the impacts of snowmobiles on park wildlife. Some commentors add that NPS should allow the parks to rest during the winter to give wildlife a chance to recover from activities during other seasons.	6,704
7.2 Commentors deny that snowmobiles have negative impacts on park resources/values. Some commentors add that independent studies done by third parties have shown no impacts on the parks.	682
7.2.1 Air quality	29
7.2.2 Soundscapes	28
7.2.3 Visitor experience	21
7.2.4 Employee and visitor health and safety	7
7.2.5 Wildlife	48
8 **Commentors identify other issues and/or concerns related to the temporary winter use plan.**	
8.1 Commentors make statements regarding the impacts of the winter use plan on the NPS mission.	12
8.1.1 Commentors emphasize that the NPS mission is to preserve unimpaired the natural and cultural resources and values of the national park system.	6,273
8.1.2 Commentors emphasize that the NPS mission is to provide park access for the enjoyment, education, and inspiration of this and future generations. Some commentors add that national parks are not wilderness areas.	66

Comment ID Comment Number of Distinct Commentors	
8.1.3 Commentors state that NPS can meet its both aspects of its mission while offering a full range of winter use activities.	5
8.2 Commentors express concern that the winter use plan may cause NPS to violate the Organic Act or other requirements such as Executive Orders or department policy.	11
8.2.1 Organic Act requires NPS to conserve resources and leave them unimpaired for future generations.	48
8.2.2 Organic Act requires NPS to enable the public to enjoy the parks.	4
8.2.3 Commentors state that snowmobile operations violate Executive Orders governing use of off- road vehicles in the parks.	8
8.3 Commentors object to undue influence on park policy from powerful business interests, corporations, and/or politicians who put their interests ahead of those of the parks. Some commentors add that the Bush administration does not value environmental protection.	364
8.3.1 Commentors charge that NPS is biased toward powerful politicians and/or corporations.	45
8.4 Commentors object to undue influence by interest groups who want to force their personal values on others.	73
8.4.1 Commentors object that park employees working at entrances wear masks provided by anti- snowmobiling organizations.	5
8.4.2 Commentors charge that NPS is biased toward environmental interest groups and against snowmobilers, as evidenced by the fact that it brought the 2003 final rule before the court in the District of Columbia.	6
8.5 Socioeconomic impacts.	4
8.5.1 Implement winter rules gradually to mitigate socioeconomic impacts.	4

Comment ID
Comment
Number of Distinct Commentors

8.5.2
Socioeconomic concerns should not outweigh environmental protection in establishing park policy; a few people should not be allowed to exploit the parks for personal profit.
470

8.5.3
Snowmobiling has positive socioeconomic impacts on park communities; restricting use damages them economically.
47

8.5.3.1
Address socioeconomic impacts to park communities/ businesses in the EA because they are essential to providing services to park visitors. Severe socioeconomic impacts resulting from policy changes may ruin local businesses that provide the infrastructure to support visitor use.
15

8.5.3.2
NPS should actively involve gateway communities in planning as part of the EA process. Some commentors make suggestions such as:
* Working with other agencies, industry, and NGOs to develop recreational opportunities outside the parks.
11

8.5.4
Prohibiting snowmobile use will have positive impacts on some park businesses, particularly those that focus on non-motorized and/or conservation- based activities (such as back- country skiing and nature photography).
26

8.6
Commentors state that winter use policy is already unclear and/or inconsistent. Some commentors add the following:

* It is hard for park communities to meet NPS needs for visitor services under such confusing circumstances.
* Doing additional long- term analysis only makes the policy more confusing
13

8.6.1
To be consistent, apply the same rules to all vehicles and activities, summer and winter, and/or do not restrict winter use unless impacts exceed those of summer activities. Some commentors add that cross- country skiers and snowshoers should be required to have guides.
31

8.6.2
Commentors question whether publishing the temporary winter use rule by December 2004 will give sufficient time to provide certainty to the public about this winter season.
5

8.7
Commentors express concerns about park access for those with special needs, such as handicapped or elderly individuals.
12

8.7.1
Handicapped visitors can only access the park by snowmobile.
4

Comment ID
Comment
Number of Distinct Commentors

8.7.2
Handicapped visitors can access the park by snowcoach or special equipment.
12

8.8
Yellowstone/Grand Teton are unique; snowmobiles can be used many other places. Some commentors add that environmental protection requirements in National Parks should set the national standard.
430

8.9
Promote and/or improve non- motorized activities in the park such as snowshoeing, yurt camping and cross- country skiing. Some commentors suggest adding a shorter cross- country track near the park entrances.
86

8.10
Lack of NPS funding to support winter use enforcement.
10

8.10.1
Commentors state that NPS should receive more funding for enforcement so that some level of managed snowmobile use can continue.
2

8.10.2
The EA should present and compare cost requirements for the various alternatives as well as the costs associated with continuing winter use analyses.
1

8.10.3
NPS should increase winter entrance fees to offset the costs of administering a reservation system.
255

8.10.4
Commentors support more funding to support the transition to a snowcoach system, including:
* Public education about transportation and winter use opportunities
* Snowcoach transportation plan
* Expansion of the snowcoach fleet
* A reservation system accessible to the general public
* A community task force.
8

8.11
Commentors object to undue influence of nonlocals on park policies, when the local populations must experience most of the impacts of those policies.
8

8.12
Commentors object to undue influence of local residents on park policies; the parks belong to all Americans, not just local communities with their own agendas.
11

8.12.1
Commentors urge NPS to terminate avalanche control measures on Sylvan Pass because it is dangerous and benefits few visitors.
1

Comment ID
Comment
Number of Distinct Commentors

8.13
Commentors state that snowmobiling is a wasteful and/or elitist sport that uses up scarce resources (oil), thus prolonging conflicts in the Middle East.
73

9
Off- scope comments

9.1
Consider the impacts of trail grooming on bison distribution. Some commentors add that both summer and winter impacts should be addressed.
18

9.1.1
Commentors state that road grooming has negative impacts on bison distribution or ecology.
16

9.1.2
Commentors deny that trail grooming has negative impacts on bison distribution or ecology.
9

9.1.3
Commentors make various requests related to the bison management study:
* NPS should make the contract for the study publicly available.
* Consider the impacts of unguided snowmobile access on bison distribution.
3

9.2
Consider the impacts of summer activities because they are more harmful than snowmobiles to park resources.
658

9.2.1
Consider the impacts of cars and busses in the summer.
38

9.2.2
Consider the impacts of two- cycle vehicles in the summer.
27

9.2.3
Ban automobile traffic in the summer.
7

9.2.4
Require park employees working at entrances to wear gas masks in the summer.
1

9.3
Commentors object to culling bison that roam outside park boundaries.
1

9.4
Commentors object to various NPS contracting practices during the summer season.
7

Comment ID
Comment
Number of Distinct Commentors

10
Commentors make statements about the NEPA process including:
*** This EA (for temporary winter use)**
*** The new EIS to address long- term analysis of winter use in the parks.**
*** The findings of previous NEPA documentation and analysis.**

10.1
Commentors state that NPS has ample scientific evidence from previous studies and should make a decision consistent with the data. Some commentors add that additional studies are a waste of time and money, and/or that they have already commented many times on the same issue.

520

10.2
The temporary nature of the plan that this EA will produce is unfair to snowmobilers. Plans resulting from other NEPA documentation have been permanent.

4

10.3
Commentors support the EA process and encourage NPS to complete it promptly. Some commentors add that extending the interim period covered by the EA from two years to four would provide more stability for local businesses and better data upon which to base a permanent decision.

9

10.4
Commentors state that NPS should use the EA to expedite phaseout of snowmobile use because previous NEPA analyses have led NPS and EPA to conclude that this action is required to protect the parks. Some commentors recommend following the transition plan outlined in the 2000 Decision and 2001 Rule.

12,588

10.5
Commentors object to interference of litigation with the NEPA process and park policy in the past. Some commentors request that the decision based on this EA remain in place throughout a full winter season, regardless of the outcome of litigation. Other commentors state that the EA cannot tier to existing NEPA documentation because of pending litigation.

6

10.6
Commentors state that there was no opportunity for the public to comment on the decision to prohibit access to Jackson Lake by snowmobile and snowplane.

1

10.7
Commentors state that Congress should settle this issue by acknowledging the existing scientific evidence and phasing out snowmobiles.

86

10.8
Commentors make statements challenging the validity of the current NEPA process.

3

Comment ID
Comment
Number of Distinct Commentors

10.8.1
Commentors state various objections to the scoping process for the EA including the following:
* NPS identified alternatives for study in the EA before public scoping ended.
* There was inadequate publicity about the scoping period.
* The scoping announcement failed to identify a purpose and need or a no action alternative.

2

10.8.2
Commentors maintain that the decision to do an EA is flawed because NPS has not issued a "statement of need."

1

10.8.3
Commentors state that an EIS, rather than an EA, is the appropriate NEPA documentation for the interim plan, and that the decision to complete an EA violates NPS director's orders relating to NEPA policies. Some commentors add that
* NPS should stop work on the EA and begin preparation of an EIS immediately.
* An EA is not appropriate because NPS must analyze the socioeconomic impacts, which requires an EIS.
* Due to the controversial nature of this issue, an EIS is required.
* An EIS is required when impacts are potentially significant.

8

10.9
Commentors question how NPS can exclude the impacts of bison management from the scope of the EA.

1

10.10
The State of Montana requests cooperating agency status in preparation of the EA.

1

11
Commentors relate personal observations or experiences.

11.1
Commentors describe personal experiences in the national parks and/or out of doors.

380

11.2
Commentors state that the outcome of the snowmobile use issue will affect their decision to visit the parks in the future.

54

Total Number of Comments Generated: 130,204

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APPENDIX D

National Park Service
U.S. Department of the Interior

Grand Teton/Yellowstone National Parks
John D. Rockefeller, Jr., Memorial Parkway
Wyoming/Montana/Idaho

Temporary Winter Use Plans
Draft Finding of No Significant Impact

August 2004

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DRAFT FINDING OF NO SIGNIFICANT IMPACT TEMPORARY WINTER USE PLANS

YELLOWSTONE AND GRAND TETON NATIONAL PARKS JOHN D. ROCKEFELLER, JR., MEMORIAL PARKWAY

This draft Finding of No Significant Impact is being prepared and made available for public review in accordance with the Council on Environmental Quality regulations implementing the National Environmental Policy Act as found in 40 CFR 1501.4(e).

WINTER USE HISTORY

The National Park Service (NPS) has been managing winter use issues in Yellowstone National Park, Grand Teton National Park, and the John D. Rockefeller, Jr., Memorial Parkway (parkway; collectively the parks) for several decades. In 1990, the NPS completed a Winter Use Plan for the parks, but by 1993, it was clear that winter visitation was increasing much more rapidly than the plan had projected. This prompted the Greater Yellowstone Coordinating Committee (composed of the park superintendents and national forest supervisors) to begin data collection for the analysis of winter use within the entire Greater Yellowstone Area. Their work culminated in 1999 with a document entitled, *Winter Visitor Use Management: A Multi-Agency Assessment*.

However, in 1997, the Fund for Animals and other plaintiffs filed a lawsuit in the United States District Court for the District of Columbia, claiming, among other things, violations of the National Environmental Policy Act (NEPA) in developing the winter use plan for the parks. In October 1997, the Department of the Interior and the plaintiffs reached a settlement agreement wherein the NPS agreed, in part, to prepare an environmental impact statement (EIS) for a new winter use plan for the parks. The Final EIS was released in October 2000, and the Record of Decision was signed on November 22, 2000. The decision stated the intention of the NPS to eliminate both snowmobile and snowplane use of the parks, based on a finding that these uses caused an impairment of the parks' resources and values. A final rule to implement this decision was published in the Federal Register on January 22, 2001.

Following this decision, the International Snowmobile Manufacturers Association (ISMA) and several other plaintiffs (subsequently including the States of Wyoming and Montana) named the Secretary of the Interior, the Director of the National Park Service, and other officials in the Department as defendants in a lawsuit filed in the United States District Court for the District of Wyoming. The lawsuit asked for the decision to prohibit snowmobiles to be set aside, alleging that the NPS violated NEPA and the Administrative Procedure Act (APA), among other things, in reaching the decision. The Department and the NPS settled this lawsuit by agreeing to prepare a Supplemental Environmental Impact Statement (SEIS) in order to incorporate any new or additional information regarding cleaner and quieter snowmobile technology and to allow for additional public involvement in the process.

On November 18, 2002, the NPS published a rule in the Federal Register delaying the snowmobile phase- out by one year, allowing time for completion of the SEIS. On February 20,

2003, the NPS issued the Final SEIS, which proposed to continue allowing snowmobile use under three strict conditions: 1) winter visitation was to be limited to no more than 950 snowmobiles per day in Yellowstone; 2) all snowmobiles would have to use best available technology; and 3) snowmobilers would have to be led by trained guides. A Record of Decision was signed on March 25, 2003 and a final rule implementing the decision was published in the Federal Register on December 11, 2003.

The new decision was challenged by the Fund for Animals and the Greater Yellowstone Coalition in the United States District Court for the District of Columbia. On December 16, 2003, the court vacated the new regulation and effectively reinstated the January 22, 2001 rule phasing out the recreational use of snowmobiles in the parks. Under the 2001 rule, approximately half the number of snowmobiles that would have been allowed under the 2003 rule were allowed into the parks for the 2003- 2004 winter season, and snowmobiles were to be phased out entirely beginning with the 2004- 2005 winter season.

Following this decision, ISMA and the State of Wyoming reopened their lawsuit against the Department and the NPS in the Wyoming Court. On February 10, 2004, the Wyoming court issued a preliminary injunction preventing the NPS from continuing to implement the 2001 phase- out rule, and directing the park superintendents to issue emergency rules for the remainder of the winter season that would be "fair and equitable" to all parties. The parks' compendia were revised to allow a total of 780 snowmobiles per day into Yellowstone, and 140 for Grand Teton and the Parkway. In Yellowstone, the requirement that all snowmobilers travel with a commercial guide remained in effect. Thus, the 2003- 2004 winter season was essentially split into two subseasons, with different rules regarding use of the parks in effect at different times. This created a highly uncertain atmosphere for park visitors, the local communities, and others with an interest in the parks, with many people not knowing how or whether they could visit the parks in winter.

Judicial proceedings are continuing in both the Wyoming and Washington, D.C., courts.

PURPOSE OF THE TEMPORARY PLAN

The Temporary Winter Use Plans Environmental Assessment has several purposes. First, it is intended to ensure that park visitors have a range of appropriate winter recreational opportunities for an interim period, pending completion of a long- term analysis on winter use. The purpose of this plan is also to ensure that these recreational activities are in an appropriate setting and that they do not impair or irreparably harm park resources or values. The NPS Organic Act, which is the fundamental law guiding national park management, mandates both of these purposes in that it requires that park resources are protected in an unimpaired condition, while allowing for their enjoyment.

Another purpose of this plan is to allow the NPS to collect additional monitoring data on strictly limited snowmobile and snowcoach use. For some time, the NPS has been monitoring air quality, natural soundscapes, wildlife, visitor experience, water quality, and employee health and safety. The winter of 2003–2004 was the first winter of strictly limited and managed snowmobile use since the program's inception in 1963. The new monitoring information from last winter and the winter of 2004–2005 will be important in developing a long- term plan. This information will be used in preparation of a long- term analysis and permanent regulation for winter use

management in the parks. In addition, this plan will allow the NPS to incorporate monitoring information from the winter of 2003–2004 and the winter of 2004- 2005 to help guide and evaluate the future winters' activities.

Another purpose of the Temporary Winter Use Plans EA is to provide the public with some degree of certainty about how winter use will be managed in the parks for an interim period. There is substantial confusion and uncertainty among the public about winter use, as illustrated by park visitation statistics from the 2003–2004 season. However, the timeframe for completing the EA and revising the parks' regulations will not provide much advance notice of the NPS's final decision before the start of the 2004–2005 winter season.

Finally, this plan will provide a structure for winter use management in the parks for an interim period. There is currently uncertainty over which management and regulatory framework would apply for the winter of 2004–2005 or future winters, and whether snowmobiles will be permitted. The purpose of this EA is to provide an interim winter use plan pending completion of a long- term winter use analysis that would further address concerns identified by both Federal Courts in Washington D.C. and Wyoming.

This EA is not intended to result in a permanent regulation authorizing continued snowmobile use in the parks. A permanent regulation on snowmobile use in the parks would be the product of a long- term winter use analysis.

This EA is not final agency action for those elements of the plans that require regulatory changes to implement. New regulations are being promulgated, and the completion of those regulations would constitute the final agency action for these Temporary Winter Use Plans.

PREFERRED ALTERNATIVE

The preferred alternative (Alternative 4) would allow 720 snowmobiles per day in Yellowstone, all commercially guided. In Grand Teton National Park and the John D. Rockefeller, Jr., Memorial Parkway, 140 snowmobiles would be allowed. With minor exceptions, all snowmobiles would be required to meet Best Available Technology (BAT) requirements. This alternative is similar to the Superintendents' compendia amendments that were in place in the parks as of February 11, 2004.

The preferred alternative was selected because it best balances winter use with protection of park resources to ensure that adverse impacts from historical types and numbers of snowmobile uses do not occur. The preferred alternative demonstrates the NPS commitment to monitor and use results to adjust winter use program. Last winter, the NPS implemented the monitoring program that it committed to in the 2003 decision, and the results of that monitoring were used to help formulate the alternatives in this EA as well as guide the decisions being made. The preferred alternative applies the lessons learned in the winter of 2003- 2004 relative to commercial guiding, which demonstrated, among other things, that 100% commercial guiding was very successful and offers the best opportunity for achieving goals of protecting park resources and allowing balanced use of the parks. Law enforcement incidents were reduced well below historic numbers, taking into account reduced visitation. That reduction is attributed to the quality of the guided program.

The preferred alternative uses strictly limited snowmobile numbers (below the historic average use level for Yellowstone) combined with best available technology requirements for snowmobiles and 100% commercial guiding to help ensure that the purpose and need for the environmental assessment is best met. With strictly limited snowmobile use combined with snowcoaches, park visitors will have a range of appropriate winter recreational opportunities. With the significant restrictions built into snowmobile use, this plan also ensures that these recreational activities will not impair or irreparably harm park resources or values.

Last winter was the first time the NPS had the opportunity to collect information on a strictly managed snowmobile program. The preferred alternative will allow the NPS to continue to collect additional monitoring data on strictly limited snowmobile and snowcoach use. The monitoring data is extremely important in helping the NPS understand the results of its management actions. Prior to the winter of 2003- 2004, the only monitoring information the NPS had was on historic snowmobile use. The EIS, SEIS, and to a certain extent this EA relied on modeling to forecast impacts. The modeling is useful for comparison purposes so that managers can understand the relative differences among alternatives, but it does not replicate on- the- ground conditions. Monitoring measures actual outcomes. With only one winter's data on strictly managed snowmobile use, the ability of the NPS to understand the impacts of a strictly controlled management regime is limited. Implementing this plan will allow for additional winters of monitoring information.

The preferred alternative also supports the communities and businesses both near and far from the parks and will encourage them to have an economically sustainable winter recreation program. Peak snowmobile numbers allowed under the preferred alternative are below the historic averages, but the snowmobile limits should provide a viable program for winter access to the parks, and in combination with snowcoach access, support overall historic visitor use levels. The preferred alternative provides certainty for park visitors, communities, and businesses by laying out a program for winter use for up to the next three winters.

OTHER ALTERNATIVES CONSIDERED

Four other alternatives were considered in the EA:

Alternative 1: Limit motorized access to snowcoaches in the parks. This alternative is similar to the 2000 decision, which was enjoined by the Wyoming Court and is still the subject of litigation in that court.

Alternative 2: Allow 318 commercially guided snowmobiles in Yellowstone and 50 unguided snowmobiles in Grand Teton, all BAT. This alternative reflects actual visitation patterns last winter and allows last winter's monitoring to be used for analytical and comparative purposes. This alternative also reflects the use levels that were of concern to the Wyoming Court when it enjoined implementation of the 2000 decision.

Alternative 3: Allow 540 BAT snowmobiles per day in Yellowstone, 82% commercially guided; 18% unguided. Allow 75 unguided BAT snowmobiles in Grand Teton. This alternative allows a comparison between the tradeoffs of an all- commercially guided program (with higher numbers, as in Alternative 4) and winter use with some unguided snowmobiles (and fewer machines, as in this alternative). Under Alternative 3, all unguided machines would need to enter

Yellowstone prior to 10:30 AM. In the analysis, the NPS believes Alternative 4, with 100% commercial guiding and higher visitor numbers better meets the purpose and need for this EA than Alternative 3 with some unguided access but fewer numbers.

Alternative 5: Allow 950 BAT snowmobiles per day in Yellowstone, 80% commercially guided and 20% non- commercially guided. Allow 190 BAT snowmobiles in Grand Teton, unguided. This is similar to the 2003 decision and rule. The 2003 rule was vacated by the United States District Court for the District of Columbia.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

The environmentally preferred alternative is the alternative that will promote the national environmental policy as expressed by §101 of the National Environmental Policy Act. That section states that it is the responsibility of the federal government to improve and coordinate federal plans, functions, programs, and resources "to the end that the Nation may:

- Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- Ensure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings;
- Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
- Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice;
- Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities; and
- Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources."

Given these criteria, alternative 1 is the environmentally preferred alternative. Alternative 1 is based on Final EIS alternative G and Final SEIS alternative 1b, each of which was determined to be the environmentally preferred alternative by both the NPS and the EPA. Alternative 1 best preserves the unique historic, cultural, and natural resources associated with the parks. This alternative yields the least impacts to air quality, water quality, and natural soundscapes because it relies on mass transit snowcoaches to provide oversnow access to the parks.

Alternative 1 was not selected because it does not best fulfill the purpose and need for the temporary plan and environmental assessment because of the limited range of uses allowed. Alternative 4 is believed to best meet all the purposes and needs, as articulated in the EA and this FONSI.

WHY THE PREFERRED ALTERNATIVE WILL NOT HAVE A SIGNIFICANT EFFECT ON THE HUMAN ENVIRONMENT

As defined in 40 CFR §1508.27, significance is determined by examining the following criteria:

Impacts that may be both beneficial and adverse

The beneficial and adverse impacts of the proposed action are described in detail in the environmental assessment. For air quality, compared to historical conditions, moderate, direct, beneficial, regional and long- term improvements would occur due to use of BAT snowmobiles only and snowcoaches. Compared to snowcoaches only, effects would be negligible and adverse in most of Yellowstone, and moderate, direct, localized, and adverse on travel corridors and developed areas. For soundscapes, the snowmobile and snowcoach use would cause moderate, adverse, direct, and short- term impacts in roadway corridors and developed areas; and moderate, adverse, direct, and short- term impacts in backcountry areas. Compared to historical conditions, moderate beneficial impacts to park soundscapes would occur because of BAT requirements and because the use of professionally trained guides can reduce sound impacts by minimizing full throttle starts and helping reduce overall travel speeds.

For the visitor experience, compared to historical conditions, this alternative would have moderate, direct, short- term, and beneficial impacts on all facets of the visitor experience. Trained guides can provide a high quality interpretive experience for visitors, better helping them better understand the resources of the parks. In 2003- 2004, a number of companies offered personalized tours of the park; that is, the guides worked with their guests to take them to the features that the clients wanted to enjoy. Compared to Alternative 1, moderate, direct, short- term, and adverse impacts would occur due to the effect of more vehicles on quiet, solitude, and road surface quality.

Wildlife adverse and beneficial effects have four components in the analysis. Vehicle- related mortality would be negligible adverse because the daily snowmobile entry limit of 720 approximates the historical average, which resulted in few wildlife deaths. Disturbance and stress response would be moderate adverse because the higher numbers of snowmobiles (as compared to alternatives 1- 3) are offset by 100% commercial guiding. Displacement would be moderate adverse because even though the number of vehicles would be roughly equal to historical levels, all vehicles would be guided. Professionally trained guides have the knowledge and experience to insure that adverse interactions with wildlife are minimized. Plus commercial guides (and their companies) have financial incentives to ensure that negative interactions are minimized. Wildlife population impacts would be none or to minor because the historical average levels of over snow vehicles resulted in no discernible impacts. Compared to historical conditions beneficial impacts upon all facets of wildlife- oversnow vehicle interactions would occur because most visitors would be traveling in guided groups.

The economic impact analysis compared the alternatives against two different baselines: historic snowmobile use and a snowmobile ban. In addition, both high impact and low impact scenarios were modeled. The analysis was also conducted on a 3- state, 5- county, and community level for both economic output and employment. Given the historic snowmobile use baseline, NPS estimates that the total impacts of Alternative 4 on the three- state area range from a decrease of $145,000 (low impact assumptions) to a decrease of $10.1 million (high impact assumptions). Given the snowmobile ban baseline, the estimates of the total impacts for Alternatives 4 on the three- state area range from an increase of $10 million (low impact) to an increase of $16.7 million (high impact).

Degree of effect on public health or safety

Compared to historical conditions, the effect on vehicular travel accidents would be moderate, beneficial, direct, and long- term impacts due to guide requirements. Toxic pollutant impacts would be moderate, beneficial, long- term, and direct due to BAT requirements and restrictions on snowmobiling compared to historical conditions. Avalanche control activities would result in moderate adverse impacts due to the exposure of control personnel to avalanche dangers. Compared to Alternative 1, the provision for snowmobile use in this alternative would result in moderate, direct, long- term, and adverse impacts.

Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas

The proposed action would have no impacts on these resources.

Degree to which effects on the quality of the human environment are likely to be highly controversial

The management of winter use in these parks has generated a great deal of public interest. Specifically, there is controversy surrounding the question of whether or not snowmobiles should be allowed to access the parks. This controversy is reflected in the number of public comments received throughout the various planning and rulemaking processes that the NPS has initiated since the late 1980s. However, the degree to which snowmobiling affects the quality of the human environment has not been nearly as controversial. Most commentors on this issue recognize that historic levels and types of snowmobiles use had adverse effects on the quality of the human environment.

Further, there is little debate within the scientific community about the degree to which winter use affects air quality, natural soundscapes, or public health or safety. Most experts agree that snowmobile and snowcoach use will have some adverse effects on these resources. The question of whether or not road grooming influences bison distribution and abundance has been controversial within the scientific community. However, the NPS is currently evaluating these issues, in part through a contract with Dr. Cormack Gates of the University of Calgary. Dr. Gates' work is a logical first step in answering the road grooming question and is a precursor to a more in depth analysis that will be in the long- term plan. Dr. Gates' report will not be available until early 2005; therefore these issues cannot be addressed in this EA, and were dismissed from this analysis, but will be addressed in the long- term plan. In the meantime, there is no dispute that the bison population is healthy.

Degree to which the possible effects on the quality of the human environment are highly uncertain or involve unique or unknown risks

Motorized winter use in Yellowstone and Grand Teton has been occurring for nearly 50 years, with snowmobiles operating in the parks since the early 1960s, and snowcoaches since 1955. The environmental assessment analyzed impacts to natural soundscapes, air quality, wildlife, employee and visitor health and safety. In addition, the EA dismissed other impact topics on the basis that there were no impacts to the environment, as documented by the EA, Final SEIS,

and/or EIS. None of the impacts identified under Alternative 4 were highly uncertain or involved unique or unknown risks. Further, monitoring of park resources has occurred, and will continue as part of this decision. This monitoring is intended to detect unacceptable or unforeseen impacts to the human environment.

Degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration

The proposed action is a temporary plan for winter use in the three parks. One of the purposes of implementing the temporary winter plan and EA is to collect additional monitoring information regarding winter use in the parks under highly regulated conditions. The information will be useful in helping develop and analyze alternatives in the long- term plan, but it will not set a precedent for the alternatives, nor will it represent a decision in principle about a future consideration. Further, motorized winter recreation has occurred in the parks for more than 50 years. The proposed action allows these uses to continue (for an interim period), but imposes strict limitations on these uses to protect park resources. The action is consistent with direction provided by the Assistant Secretary for Fish and Wildlife and Parks to the Director of the National Park Service regarding snowmobile use throughout the National Park System in a memorandum dated February 17, 2004.

Whether the action is related to other actions with individually insignificant but cumulatively significant impacts

The proposed action has adverse impacts that range in intensity from minor to moderate. These effects, in conjunction with the adverse effects of any other past, present, or reasonably foreseeable future actions, would not have significant impacts on any park resources or values. Further, the cumulative effects analysis indicates there would be no significant adverse impacts to park resources or values.

Degree to which the action may adversely affect districts, sites, highways, structures, or objects listed on National Register of Historic Places or may cause loss or destruction of significant scientific, cultural, or historical resources

The proposed action will not adversely affect historic properties.

Degree to which the action may adversely affect an endangered or threatened species or its critical habitat

The EA did not identify any significant effect to endangered, threatened of species of special concern. Informal consultation with the U.S. Fish and Wildlife Service is underway.

Whether the action threatens a violation of Federal, state, or local environmental protection law

This action would not violate any federal, state, or local environmental protection laws.

IMPAIRMENT

The National Park Service has determined that implementation of the proposed action will not constitute impairment to Yellowstone or Grand Teton National Park's resources and values. This conclusion is based on the analysis of impacts to park resources and values in the EA. As described in the EIS, use of snowplanes on Jackson Lake in Grand Teton National Park would impair park resources and values, and snowplanes would not be permitted under the proposed action or the other alternatives considered in this EA.

PUBLIC INVOLVEMENT

Scoping

The public scoping period for this EA was open from June 14 to July 13, 2004. The NPS received 15,083 documents commenting on the scope of the EA, including 13,637 in electronic format and 1,446 in hard copy. Of these documents, 10,534 were one of ten different form letters received; 4,201 were personal or "non- form" letters (some people sent more than one kind of form letter as well as one or more non- form letters, so the form/non- form total does not match the total number of documents). At least nine people from every state in the country sent comments, plus four from Puerto Rico. Although 2,566 Californians submitted comments, only 8% of the commentors were from the three states intersecting in Yellowstone: 534 from Montana, 334 from Wyoming, and 324 from Idaho.

Although this public scoping period was primarily intended to allow people to comment upon the scope of this Environmental Assessment, many people expressed their opinions regarding winter use management in Yellowstone. A detailed breakdown of the public scoping comments and opinions on winter use management is provided in Appendix C of the EA.

Public Review of EA and Draft FONSI

The EA and Draft FONSI will be on public review for 30 days. Results of required agency consultation and public review will be summarized in the final Finding of No Significant Impact.

CONCLUSION

The proposed action does not constitute an action that necessitates preparation of an environmental impact statement (EIS). Based on the environmental assessment, the proposed action will not have a significant effect on the human environment. Negative environmental impacts that could occur are minor to moderate and generally temporary in effect. This is a temporary winter use plan, intended to be in effect for up to three winters and to be supplanted with a new long- term plan. There are no significant and unmitigated adverse impacts on public health, public safety, threatened or endangered species, sites or districts listed in or eligible for listing in the National Register of Historic Places, or other unique characteristics of the region. No highly uncertain or controversial impacts, unique or unknown risks, cumulative effects, or elements of precedence were identified. Implementation of the action will not violate any federal, state, or local environmental protection law.

Recommended: _____ _____

Superintendent, Yellowstone National Park Date

_____ _____

Superintendent, Grand Teton National Park Date
John D. Rockefeller, Jr., Memorial Parkway

Approved: _____ _____

Intermountain Regional Director Date