

**ENVIRONMENTAL ASSESSMENT**  
**FOR**  
**PERMANENT CLOSURE OF THE FORMER MOUNT MCKINLEY NATIONAL**  
**PARK TO SNOWMACHINE USE**

**United States Department of the Interior**  
**National Park Service**  
**Denali National Park and Preserve**

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## **TABLE OF CONTENTS**

<b>PURPOSE AND NEED</b>	<b>1</b>
<b>–BACKGROUND</b>	<b>3</b>
Statutory Authorities and Policy Obligations: The NPS Organic Act and ANILCA	3
Statutory and Regulatory Framework Specific to Section 1110(a)	4
History of Snowmachine Use in Denali National Park and Preserve	7
Temporary Closure and Legal Challenge	8
<b>–ISSUES AND IMPACT TOPICS</b>	<b>9</b>
Air and Water Quality	9
Vegetation, Soils, and Wetlands	9
Wildlife Values and Habitat	10
Cultural Resources	10
Recreation, Visitor Use, and Wilderness Values	10
Subsistence Use	11
Park Management	11
Issues Considered and Eliminated from Further Consideration	11
<b>DESCRIPTION OF THE ALTERNATIVES</b>	<b>12</b>
Elements Common to All Alternatives	12
Alternative 1: No Action	12
Alternative 2: Partial Closure of the Old Park to Snowmachine Use	13
Alternative 3: Temporary Closures of the Old Park to Snowmachine Use	13
Alternative 4: Permanent Closure of the Old Park to Snowmachine Use (Preferred Alternative)	13
Alternatives Considered and Eliminated from Further Consideration	13
<b>AFFECTED ENVIRONMENT</b>	<b>14</b>
Park Resource Information Summary	15
Climate and Snowfall	15
Air and Water Quality	16
Vegetation, Soils, and Wetlands	16
Wildlife Values and Habitat	17
Cultural Resources	19
Recreation, Visitor Use, and Wilderness Values	19
Subsistence Use	22
Park Management	22
<b>IMPACT TABLE</b>	<b>24</b>

<b>ENVIRONMENTAL CONSEQUENCES</b>	<b>27</b>
Introduction	27
Cumulative Effects Considerations	27
Alternative 1: No Action	29
Alternative 2: Partial Closure of the Old Park to Snowmachine Use	46
Alternative 3: Temporary Closures of the Old Park to Snowmachine Use	53
Alternative 4: Permanent Closure of the Old Park to Snowmachine Use	53

<b>COORDINATION AND CONSULTATION</b>	<b>57</b>
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<b>BIBLIOGRAPHY</b>	<b>58</b>
---------------------	-----------

## **FIGURES**

- Figure 1: Alaska and Denali National Park and Preserve
- Figure 2: Old Park - Former Mt. McKinley National Park
- Figure 3: Old Park - From Cantwell to West Fort Chulitna
- Figure 4: Park/Region: Denali National Park and Preserve

## **PHOTOS**

- Photo 1: Recreational Snowmobiling Adjacent to Denali National Park and Preserve
- Photo 2: Vegetation Damage Due to Snowmachine Traffic
- Photo 3: Compacted Snow from a Winter Trail Remaining Late into Spring
- Photo 4: Multiple Snowmachine Trails Leading into Denali National Park and Preserve
- Photo 5: Multiple Snowmachine Trails in Denali National Park and Preserve

## **APPENDICES**

- APPENDIX A: Section 810(A) of ANILCA Summary of Evaluations  
and Findings
- APPENDIX B: Proposed Rulemaking

## PURPOSE AND NEED

The National Park Service (NPS) is proposing a regulation to permanently close to the use of snowmachines the part of Denali National Park and Preserve known as the former Mount McKinley National Park (Old Park) to prevent detriment to the resource values of this area. Section 1110(a) of the Alaska National Interest Lands Conservation Act (ANILCA) allowed on conservation system units in Alaska snowmachine use for "traditional activities." The NPS also proposes to define traditional activity as follows:

An activity that generally and lawfully occurred in the Old Park contemporaneously with the enactment of ANILCA, and that was associated with the Old Park, or a discrete portion thereof, involving the consumptive use of one or more natural resources of the Old Park such as hunting, trapping, fishing, berry picking or similar activities. Recreational use of snowmachines was not a traditional activity. If a traditional activity generally occurred only in a particular area of the Old Park, it would be considered a traditional activity only in the area where it had previously occurred. In addition, a traditional activity must be a legally permissible activity in the Old Park.

The NPS revised the proposed definition of traditional activity for the final rule. The changes were made to clarify the meaning of the language, and to make the definition specifically applicable only to the Old Park. The revisions do not alter the meaning of the definition as it appeared in the proposed rule or the application of that meaning to the Old Park as evaluated in the alternatives in this EA.

The closure to snowmachine use within the Old Park would be consistent with the park's long-standing management strategy for this area of the park, and is needed to prevent detriment to its resource values. This regulation would prevent snowmachine use in that area to protect and preserve the resource values of the Old Park, including its wildlife, wildlife habitat, wilderness, and other natural resources. And, it would strengthen park's ability to manage the area to provide opportunities for solitude and non-motorized winter activities within this area.

A primary purpose of establishing Denali National Park and Preserve was to provide protection for wildlife and habitat. Since 1917, when Mount McKinley National Park was established, NPS has managed the Old Park as a wildlife refuge, promoting minimal disturbance of natural wildlife conditions while developing opportunities for wildlife viewing and other recreation activities.

In 1980, with the enactment of ANILCA, Congress expanded Mount McKinley National Park by adding approximately 2.4 million acres of public lands, established some 1.3 million acres of public lands as a preserve, and redesignated the combined areas as Denali National Park and Preserve. The legislative history of ANILCA directed that the Old Park was "intended to be [a] large sanctuar[y] where fish and wildlife may roam freely, developing their social structures and evolving over long periods of time as nearly as possible without the changes that extensive human activities would cause." (Report of the Senate Committee on Energy and Natural

Resources, Report No. 96-413, p.137.) The proposed snowmachine use closure applies to the approximately two-million-acre pre-ANILCA portion of Denali National Park and Preserve known as the Old Park.

The Old Park historically has been managed for non-motorized winter recreation such as dog mushing, snowshoeing, and cross-country skiing. No history of authorized general public snowmachine use for any activity had been established in the Old Park and, prior to the passage of ANILCA, the Old Park was closed to snowmachines. Enactment of ANILCA left this general prohibition of snowmachine use in the Old Park area intact unless the snowmachine use was for the purpose of conducting a traditional activity. Sec. 1110(a). Snowmachine use unconnected with a traditional activity did not fall within the terms of Section 1110(a) and, thus, remained prohibited in the Old Park. However, NPS had not promulgated a regulatory definition for "traditional activity."

In applying the definition of traditional activity to the Old Park, the NPS is unable to identify any specific traditional winter activity. The examples of traditional activities identified in the House and Senate Committee reports are subsistence and sport hunting, trapping, fishing, and berry picking. Sport and subsistence hunting, trapping, and other subsistence uses were historically prohibited in the Old Park and still are today. No general use of fishing or berry picking has taken place in the Old Park in the winter.

Technological advances have enabled snowmachiners to reach and, recently, enter some corridors in the Old Park in a limited number of drainages on the south side of the Alaska Range. In fact, over the past 6 years, numerous incursions into the Old Park have occurred, particularly in these drainages. Lack of a closure and a clear definition of traditional activity, along with improved technology and increased snowmachine use, could result in detrimental effects on the resource values of the Old Park and could compromise the ability of NPS to manage this area of the park for the purposes prescribed in law.

The proposed permanent closure would not affect the park and preserve's approximately four-million-acre ANILCA additions, where snowmachine use is permitted for traditional activities, and for travel to and from villages and homesites, subject to reasonable regulations. This proposed permanent closure follows a nearly 12-month temporary closure of most of the Old Park instituted in February 1999. The temporary closure was based on a finding of detriment to resource values from the use of snowmachines.

In recent litigation brought by the Alaska State Snowmachine Association (ASSA), the Court voided NPS's February 1999 temporary closure of most of the Old Park because the NPS failed to define "traditional activity." Alaska State Snowmachine Association v. Babbitt, et al., No. A99-59 CV (JWS), Order dated November 18, 1999. The NPS published proposed regulations that would define traditional activity and also would permanently close the Old Park to snowmachine use. 64 F.R. 61563 (November 12, 1999). Public comment on the proposed regulations closed on January 25, 2000.

This environmental assessment (EA) addresses that portion of the proposed regulations not already addressed in other environmental documents, namely the proposed definition of traditional activity and the permanent closure of the Old Park to snowmachine use. It evaluates the potential environmental impacts of the proposed closure along with three alternatives. This EA has been prepared in accordance with the National Environmental Policy Act (NEPA) and regulations of the Council on Environmental Quality (40 CFR 1508.9).

## **BACKGROUND**

### **Statutory Authorities and Policy Obligations: The NPS Organic Act and ANILCA**

In 1917 Congress established Mount McKinley National Park to "set apart as a public park for the benefit and enjoyment of the people . . . for recreation purposes by the public and for the preservation of animals, birds, and fish and for the preservation of the natural curiosities and scenic beauties thereof . . . said park shall be, and is hereby established as a game refuge". (39 Stat. 938). The establishment of the area was meant to prevent damage from new types and levels of use brought on by rapid changes in technology and access. Additions to the park were made in 1922 and 1932 to provide increased protection for park values and, in particular, wildlife. Since 1917, the park has been managed pursuant to the NPS Organic Act of 1916 and subsequent amendments.

The NPS Organic Act directed the Secretary of the Interior and NPS to manage national parks and monuments to "conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." (16 U.S.C. 1.) The Organic Act also granted the Secretary the authority to implement "rules and regulations as he may deem necessary or proper for the use and management of the parks, monuments and reservations under the jurisdiction of the National Park Service. (16 U.S.C. 3.) In 1978, amendments to the NPS Organic Act expressly articulated the role of the national park system in an effort to ensure ecosystem protection. The amendments further enforced the primary mandate of preservation by stating: 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, except as may have been or shall be directly and specifically provided for by Congress." (16 U.S.C. 1-a1.) In meeting its responsibilities under the Organic Act, NPS need not wait for actual damage to occur before taking protective action to prevent degradation to wildlife and other natural resources [Wilkins v Department of the Interior, 995 F.2d 850, 853 (8th Cir. 1993); New Mexico State Game Commission v Udall 410 F.2d 1197 (10th Cir. 1969).]

The NPS Management Policies (1988) interpret laws and regulations and guide decision making within park units. With regard to the spectrum of resource values to be protected, the Management Policies state:

"The individual parks contain various tangible natural and cultural features such as animals, plants, waters, geologic features, historic buildings and monuments, and

archeological sites. They also have intangible qualities such as natural quiet, solitude, space, scenery, a sense of history, sounds of nature, and clear night skies that have received congressional recognition and are important components of people's enjoyment of parks. These *Management Policies* use the term resource values to mean the full spectrum of tangible and intangible attributes for which parks have been established and are being managed." (NPS Management Policies, 1988, p.1:3)

With regard to implementing the "unimpaired" mandate of the Organic Act, the Management Policies state:

"The word 'unimpaired' plays an important role in the conservation of resources and providing for present-day public enjoyment. Both physical resources, such as wildlife and geologic features, and intangible values, such as scenic vistas and solitude, may be impaired. It is NPS policy to treat potential impairments in the same manner as known impairments. When there is thought to be potential for resource impairment, actions will be based on strategies that retain the resource in an unimpaired condition until such time as doubts are resolved." (NPS Management Policies, 1988, p.1:3-1:4)

In 1980, approximately 3.7 million acres of new park and preserve lands were added to Mount McKinley National Park through ANILCA, and the entire area was re-designated as Denali National Park and Preserve [ANILCA Sec. 202 (3) (a)]. Protection of wildlife, undisturbed ecosystems, and opportunities for wilderness recreation are specifically mentioned within the overarching purposes of ANILCA Section 101. The legislative history also states that certain NPS units in Alaska, including the Old Park portion of Denali National Park and Preserve, . . . are intended to be large sanctuaries where fish and wildlife may roam freely, developing their social structures and evolving over long periods of time as nearly as possible without the changes that extensive human activities would cause." (Report of the Senate Committee on Energy and Natural Resources, Report No. 96-413, p.137.) The values of solitude and the challenge of remote wilderness also are specifically mentioned in the legislative history in connection with all national park units in Alaska. (Ibid., pp. 137-8.)

Virtually the entire Old Park (95%) was designated as wilderness by ANILCA. The term wilderness when used in ANILCA is meant to have the same meaning as its use in the Wilderness Act [ANILCA Sec. 102 (13)]. Except as otherwise expressly provided for in ANILCA, wilderness designated by ANILCA is to be administered in accordance with the Wilderness Act (ANILCA Sec. 707).

Section 203 of ANILCA directs that the new and re-designated units of the National Park System be administered pursuant to the Organic Act and its later amendments, subject to valid existing rights and, as appropriate, under Section 1313 and the other applicable provisions of ANILCA.

#### **Statutory and Regulatory Framework Specific to ANILCA Section 1110(a)**

Prior to ANILCA, snowmachine use in Alaska national parks was permitted only at NPS's discretion, and snowmachine use was not allowed in the Old Park. Decisions on the allowance of

snowmachine use were controlled by regulation and executive orders related to the administration of park areas under the Organic Act and its amendments or the Wilderness Act in areas where wilderness was designated. [Title 36 CFR, Part 2.18 (formerly 2.34) and Executive Orders 11644 and 11989] The use was not allowed unless specifically permitted. The agency discretion to treat snowmachine use as prohibited unless specifically allowed was superceded in ANILCA Section 1110(a), which applies to all conservation system units in Alaska, including NPS administered areas. The methods of transport specifically mentioned in Section 1110(a) (i.e., for traditional activities) are snowmachines, motorboats, airplanes, and non-motorized surface transportation methods. The legislative history indicates that the limitation of this particular area of agency discretion was a primary purpose of this section of ANILCA on special access (Report of the Senate Committee on Energy and Natural Resources, Report No. 96-413, p.248 and p.299.)

The language notwithstanding any other provision of this Act, or other law allows certain provisions of Section 1110(a) to modify specific sections of the Wilderness Act that prohibit motorized use in designated wilderness. Section 1110(a) applies to all conservation system units, including designated wilderness. The Department of the Interior has interpreted this to mean that Section 1110(a) applies to Denali wilderness areas and that no exception is granted for the Old Park (51 FR 31619, 31627, September 4, 1986). However, the Department of the Interior has acknowledged that the opening of the pre-ANILCA areas, including the Denali wilderness areas, was an inadvertent result of the legislation rather than an intentional action by Congress, and that this should be corrected. In a Department of the Interior news release dated April 6, 1983, Deputy Under Secretary of the Interior, William P. Horn, announced a proposal to close the pre-ANILCA NPS units to motorized use:

Prior to ANILCA, the critical wildlife habitat and natural resource areas of the three units (Katmai, Glacier Bay, and Mount McKinley) were essentially closed to motorized access . . . Congress inadvertently opened these areas to this kind of use. By re-establishing the historical public use restrictions, the National Park Service seeks to correct the action and restore the historical level of resource protection.

Section 1110 (a) does not grant absolute access, however. The significant effect of Section 1110(a) is that snowmachine use is an authorized form of access for certain activities on ANILCA conservation system units. In wilderness, the use of snowmachines is no longer subject to the earlier individual-oriented, wilderness pre-existing use type test. Rather, if the activity that the snowmachine is being used for is a traditional activity that generally occurred in the area prior to its designation as a unit, then the use of a snowmachine for that activity is allowed until specifically prohibited. (Report of the Senate Committee on Energy and Natural Resources, Report No. 96-413, p.248.)

No definition of traditional activity is provided in ANILCA. However, the legislative history of ANILCA mentions four types of traditional activities: subsistence and sport hunting, fishing, and berry picking. (Senate Committee on Energy and Natural Resources, Report No. 96-413, p.247-248.) Trapping also is referred to as a traditional activity in Senate Energy Committee mark-up



(August 1, 1978, pgs. 56 & 62). Other discussions indicate that general recreation, absent of a connection to resource gathering, was not considered to be a traditional use. As far back as 1981, in the implementing regulations to ANILCA, NPS cautioned [p]rospective snowmachine users [to] note that the legislative history of Section 1110(a) defines a traditional activity in terms of a use generally occurring in a park area prior to its designation. (46 FR 3184, June 17, 1981)

In 1986, the Department of the Interior promulgated 43 CFR 36.11 to implement Section 1110(a). Responding to comments suggesting that traditional activities should be defined, the Department stated:

Because these regulations apply to a number of areas under the administrative jurisdiction of three agencies, it has been decided that it would be unwise, and perhaps impossible to develop a definition that would be appropriate for all areas under all circumstances. Exactly what traditional activities are must be decided on a case-by-case basis. Once the agencies have had the opportunity to review this question for each area under their administration, it may be possible to specifically define traditional activities for each area. (51 FR 31627, September 4, 1986)

The NPS suggested a definition of traditional activity in the 1986 General Management Plan (GMP) for Denali National Park and Preserve (see p. 195). The Old Park was closed for many years to snowmobiling this activity by way of Superintendent's Orders (Compendium) based on an interpretation that recreational snowmobiling was not a traditional activity in the Old Park. (Compendium, Denali National Park and Preserve, May 8, 1997.) This interpretation was restated in the current temporary rule that also closed the area of the Old Park to traditional activities (Statement of Finding: Temporary Closure of the Former Mount McKinley National Park Area of Denali National Park and Preserve to the Use of Snowmachines for Traditional Activities, February 3, 1999.)

Considering the definition in the context of the Old Park, NPS is unable to identify any specific traditional winter activities that occurred prior to the enactment of ANILCA. Sport and subsistence hunting, trapping, and other subsistence uses were historically prohibited in the Old Park. No general use of fishing or berry picking has taken place in the winter.

In addition to authorizing the use of snowmachines for traditional activities, Section 1110(a) of ANILCA also authorizes the use of snowmachines "for travel to and from villages and homesites." The legislative history indicates that concern over the large size of the new units, which would overlay pre-existing activities and travel routes, prompted the inclusion of this provision. (Comments by Senator Stevens, p. 65-66, Senate Energy Committee mark-up, August 1, 1978.) The Old Park has no villages or homesites or other non-federal patented land within its boundary, does not effectively surround any villages or homesites and was never used as a snowmachine route to a village or homesite prior to ANILCA. In the 19 years since the passage of ANILCA, only one use under this provision is known to have occurred, when an individual unsuccessfully attempted to cross the Old Park to a Kantishna inholding. All homesites or

villages outside the boundary of the Old Park (including Kantishna) have reasonable alternate routes for snowmachine access that have been used frequently for such access.

For snowmachines, travel also is limited to periods of adequate snowcover or frozen river conditions. The objective of this requirement is to limit damage to resource values such as vegetation and soils. A suggested depth of generally 6 to 12 inches or more is included in the regulations implementing Section 1110(a) [(43 CFR 36.11(a)(2)]. However, no specific standard for adequate snowcover has been established for Denali National Park and Preserve.

In addition to the aforementioned limitations, the use of a snowmachine is subject to reasonable regulations by the land manager to protect the natural and other values of the unit. The legislative history also reiterates the ability to regulate to protect the values of the area (Report of the Senate Committee on Energy and Natural Resources, Report No. 96-413, p.299). Section 1110(a) also contains a procedural requirement that must be met before a closure can take effect. A notice and hearing in the vicinity of the affected area is required, as well as the preparation of a finding that shows the use would be detrimental to the resource values of the unit or area. The legislative history indicates that agencies retained the authority to completely close certain areas within a unit where it is necessary to protect the values of the unit (Report of the Senate Committee on Energy and Natural Resources, Report No. 96-413, p.299).

#### **History of Snowmachine Use in Denali National Park and Preserve**

The Old Park, which constitutes approximately one-third (2.2 million acres) of the land area of Denali National Park and Preserve, has been closed to snowmachine use by the general public. The winter use of mechanized equipment by the general public did not regularly occur in the Old Park from the time Mount McKinley National Park was established in 1917 to 1970, largely due to the remoteness of the area and the lack of dependable equipment. The park's administrative use of mechanized equipment in the winter for patrols and maintenance of facilities also was limited and was phased out by 1974 in favor of dog teams, the historic means of winter access in the park since its establishment. A concession contract for passenger and freight transport by dog team was developed in 1974, consistent with this historic means of winter access for the area. Current endorsement of the park's policy regarding winter access into the Old Park is manifested in three commercial dog sled tour businesses within the park, all of which depend on wilderness values for experiential aspects of their services.

In 1970 when snowmachine use became both a more common activity and a concern to park managers, the Old Park was closed to public snowmachine use under a nationwide regulation. From 1970 to 1980, illegal incursions into the Old Park by snowmachine users were sporadic and minimal. The NPS enforced the regulation by regular patrols, the posting of signs, visitor education, and issuance of violator warnings. As snowmachine technology evolved during the 1980's and early 1990's, more individuals began to use the lands in and near Denali National Park and Preserve for snowmobiling. Incursions into the Old Park still were infrequent.

Snowmachine use in and near the Old Park area began to increase in the early 1990's. This growing use occurred simultaneously with an increase in snowmachine sales and use throughout

Alaska. In addition, the character and pattern of the use also changed. Snowmachine manufacturers began production of more reliable, higher performance vehicles that could access steep terrain and travel greater distances. Snowmachine use within Alaska changed from a utilitarian form of access for the traditional activities discussed in ANILCA, such as hunting and trapping, to a new and popular recreational activity in and of itself (Photo 1). During the past 6 years, these changes have resulted in numerous incursions into the Old Park, specifically in a limited number of drainages on the south side of the Alaska Range. Concern about new pressures on park resources increased with publication of a newsletter article urging recreationists to travel throughout the former Mount McKinley National Park area (Alaska Snow Rider, Volume 9, Issue 6, October 1998).

### **Temporary Closure and Legal Challenge**

On February 3, 1999, NPS instituted a temporary closure of portions of the Old Park to the use of snowmachines for traditional activities (NPS, 1999). To enforce the closure, NPS allocated administrative resources to prevent the degradation of the natural resources and other values of the Old Park area.

Based on information available, analysis of public hearing testimony, and analysis of nearly 1,500 written comments, NPS found that snowmachine use for traditional activities within the Old Park "would be detrimental to the resource values of the unit or area," pursuant to 43 CFR 36.11(h). The superintendent, therefore, implemented a 1-year closure in the Old Park to the use of snowmachines for traditional activities. The intent of the closure was to prevent harm to the resource values of the Old Park, including its wildlife, wildlife habitat, and other natural resources; its opportunities for the conduct of non-motorized recreational activities undisturbed by motorized activities; and its opportunities for quiet and solitude. Two corridors in the Old Park, one in the Cantwell Creek area and another in the Bull River/Easy Pass area, were excluded from the temporary closure to foster opportunities for information gathering.

A number of public comments indicated concern that the resource evaluation and legal basis used in the finding for the temporary closure could serve as a precedent for closures in other areas in Alaska. Section 1110(a) of ANILCA applies only to the conduct of traditional activities within conservation system units. The management of the remaining portions of Denali or other conservation system units in Alaska for snowmachine use was unaffected by the decision to impose a 1-year closure of the Old Park to snowmachine use.

The Alaska State Snowmachine Association Inc., et. al. (ASSA), as plaintiffs and the Wilderness Society et. al. (WS), as defendant-intervenors presented various legal challenges to the temporary closure of the Old Park in Federal District Court. The ASSA contended that NPS violated the mandated snowmachine access expressly provided for in Section 1110(a) of ANILCA, failed to consider less restrictive alternatives, and failed to complete an environmental assessment and provide the adequate public participation required by NEPA. The WS contended that NPS failed to abide by NEPA (i.e., evaluate the effects of the temporary closure in an environmental assessment) and that NPS violated the Wilderness Act by allowing snowmachine use in the two corridors left open by the temporary closure.

The Court voided NPS's February 1999 temporary closure of most of the Old Park because the NPS failed to define "traditional activity." Alaska State Snowmachine Association v. Babbitt, et al., No. A99-59 CV (JWS), Order dated November 18, 1999. The NPS published proposed regulations that define traditional activity and also proposed a permanent closure of the Old Park to snowmachine use. 64 F.R. 61563 (November 12, 1999). Public comment on the proposed regulations closed on January 25, 2000.

## **ISSUES AND IMPACT TOPICS**

Issues and impact topics are identified and form the basis for environmental analysis in this EA. A brief rationale is provided for each issue or topic that is analyzed in the environmental consequences section. Issues and topics considered but not addressed in this document also are identified.

### **Air and Water Quality**

Snowmachine use may degrade the pristine air and water quality which currently exist within the Old Park. Specific concerns include:

- Air pollution due to emissions from two-stroke engines.
- Deposition of two-stroke engine emissions into snowpack.
- Alteration of the water chemistry of streams and rivers due to unburned hydrocarbons from incomplete combustion and from raw petroleum products from leaky engines, leading to a degradation of water quality.

### **Vegetation, Soils, and Wetlands**

Snowmachine use could adversely affect tundra and other vegetation communities, including wetlands, and sensitive permafrost soils in the Old Park. Specific concerns include:

- Vulnerability of soils and vegetation to snowmachine use due to typically low precipitation north of the Alaskan Range, resulting in insufficient snow cover to protect these resources.
- Sensitive permafrost soils may be damaged.
- Compacting of snow by snowmachines, particularly in areas of frequent use, would decrease insulating characteristics of snow and allow frost to penetrate deeper under trails, causing a delay in snowmelt and a delay or preclusion of seed germination, leading to a change in species composition and plant density.
- Abrasion and breakage of exposed vegetation, including seedlings, shrubs, and young trees, due to snowmachine traffic.

### **Wildlife Values and Habitat**

Snowmachine use could result in impacts to wildlife behavior, distribution, and abundance. Specific concerns include:

- Wildlife exposure to snowmachines can cause behavioral changes deleterious to the health of the animals.
- Wildlife abandonment of preferred habitat.
- Harassment leading to alteration of wildlife population distributions.
- Disturbance to bears in their dens.
- Snowmachine tracks creating snow barriers to the movements of subnivean (situated or living under the snow) animals.
- Crushing of small mammals, particularly subnivean animals.
- Compacted trails could change distribution patterns of moose, caribou, and other animals by providing energy-efficient travelways.
- Degradation of aquatic biological communities due to degraded water quality.

### **Cultural Resources:**

- Winter access to the Old Park via snowmachines could result in increased numbers of snowmachines using the Old Park and increase the risk of vandalism to 13 cabins on the National Register of Historic Places, others eligible for nomination, and other structures that have incomplete documentation.
- Many archeological sites are at the ground surface and could be exposed to increased disturbance because of increased snowmachine use.

### **Recreation, Visitor Use, and Wilderness Values**

Snowmachine use would result in impacts to recreation, visitor use and wilderness values. Specific concerns include:

- User conflicts between snowmachine users and non-motorized recreationists such as cross-country skiers, skijorers, and dog mushers.
- Snowmachine use would diminish the wilderness values, including natural quiet, solitude, and undisturbed vistas, that are the foundation of the experience for the historic winter users of the Old Park.
- Snow compaction with subsequent soil compaction would make some winter trails visible in the summer.
- Diminished ability for the park to protect designated wilderness.
- Many members of the public expressed concern that closing any portion of Denali National Park and Preserve to snowmachine use would be a violation of ANILCA.
- Many members of the public expressed concern that opening any portion of Denali National Park and Preserve to snowmachine use would be a violation of ANILCA and the Wilderness Act.

### **Subsistence Use**

Snowmachine access to the Old Park could cause change in the presence and distribution of animals such as moose, furbearers, and ptarmigan in areas of the park and preserve where subsistence activities are authorized.

### **Park Management**

Snowmachine use would result in impacts to park management. Specific concerns include:

- The public and NPS have identified the need to define "traditional activity " (ANILCA/ 1110(a)) for snowmachine use within the Old Park. Disagreement exists regarding the definition of this term, leading to confusion and disagreement about whether snowmobiling in the Old Park is an allowed use.
- The Old Park's value as a reference site for ecological studies would be compromised by snowmachine use.
- Snowmachine use in the Old Park would result in additional administrative needs for enforcement and resource studies and monitoring.

## **ISSUES CONSIDERED AND ELIMINATED FROM FURTHER CONSIDERATION**

### **Effects on Threatened and Endangered Species**

The Endangered Species Act requires an analysis of impacts on all federally listed threatened and endangered species, as well as species of special concern. In compliance with Section 7 of the Act, the U.S. Fish and Wildlife Service (USFWS) was consulted. The American peregrine falcon (*Falco peregrinus anatum*), the subspecies that nests in the Denali region, was formerly listed as endangered and was delisted as of August 25, 1999 (64 FR 46542). No Federally designated threatened or endangered species are known to occur within Denali National Park (pers. comm. Larry Bright, USFWS, Fairbanks, Alaska).

### **Floodplain Management**

Executive Order 11988, Floodplain Management, directs federal agencies "to avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative." Neither the proposed action nor its alternatives would affect floodplains or floodplain management.

### **Economics**

The proposed action is not expected to adversely affect the economy of the local or regional area. Any economic benefits to the local or regional economy from snowmobiling would be the same whether the Old Park is closed to snowmachine use or not because the small numbers of snowmachiners displaced from the Old Park due to the proposed closure likely would use other easily available large areas open to snowmobiling which are nearby.

### **Effects on Minority and Low-Income Populations and Communities:**

Executive Order 12898 requires federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human or environmental effects of their programs and policies on minorities and low-income populations and communities. Neither the proposed action nor the alternatives would result in significant direct or indirect negative adverse effects on any minority or low-income populations or communities.

## **DESCRIPTION OF THE ALTERNATIVES**

This EA describes the proposed action (definition of traditional activity and closure of the Old Park to snowmachine use) and three alternatives for managing snowmachine use in the Old Park.

### **Elements Common to All Alternatives**

The following elements are common to the four alternatives presented in this EA:

#### Related Park Planning

Any special regulation or action related to the use of the park's backcountry would be reviewed in the Environmental Impact Statement for the General Management Plan Amendment for the Backcountry (GMP Amendment/Backcountry EIS). A draft plan and EIS should be available for public review in fall 2000.

#### Resource Management

The NPS will initiate additional studies on snowmachine use within Denali National Park and Preserve, including studies on the effects of snowmachine use on park resource values.

#### Visitor Protection

General regulations for the operation of snowmachines in NPS areas nationwide are published in 36 CFR 2.18. The regulations in Section 2.18 (a), (b), and (d) would apply to all alternatives except the proposed action. These regulations: (1) require compliance with state laws which do not conflict with park regulations; (2) prohibit excessive noise; (3) prohibit racing and operating a snowmachine in excess of 45 miles per hour; (4) prescribe age limitation for the operation of a snowmachine, and; (5) require safe operations of snowmachines similar to the requirements for the operation of other motor vehicles. The provisions of Section 2.18 (c), describing areas of parks open for snowmachine use, are superceded in Alaska park units by the special access provisions of ANILCA (see 43 CFR 36.11).

## **Alternatives**

### Alternative 1: No Action

Under the No Action Alternative, snowmachine use in the Old Park would continue (Figure 2). No definition of traditional activity would be added to the NPS regulations.

Snowmachine use for traditional activities would be contingent on a determination by the superintendent of sufficient snow depth (generally 6-12 inches or more) to protect the underlying vegetation and terrain and on public notification of that determination (43 CFR 36.11(a)(2)).

#### Alternative 2: Partial Closure of the Old Park to Snowmachine Use

Under this alternative, the Old Park would be closed to the use of snowmachines north of the crest of the Alaska Range and southwest of the drainage divide of the West Fork of the Chulitna River, based on a finding of detriment to park resources (Figure 3). No definition of traditional activity would be added to the NPS regulations. This action would leave about 180,000 acres of the approximately two million acre Old Park open to snowmachine use for traditional activities. The area left open to snowmachine use has experienced virtually all of the past snowmachine use in the Old Park.

Snowmachine use would be contingent on a determination by the superintendent of sufficient snow depth (generally 6-12 inches or more) to protect the underlying vegetation and terrain and on public notification of that determination [43 CFR 36.11(a)(2)].

#### Alternative 3: Temporary Closures of the Old Park to Snowmachine Use

Under this alternative, a series of 12-month temporary closures would be instituted to the use of snowmachines in the Old Park (Figure 2). The temporary closures would be based on a finding of detriment to park resources. No definition of traditional activity would be added to the NPS regulations. In addition, as required by Section 1110(a) of ANILCA, hearings would be scheduled for public testimony and a finding would be published to support each temporary closure action. Unlike the 1999-2000 temporary closure, no snowmachine use corridors would be made available in the Cantwell Creek and Bull River-West Fork Chulitna Rivers areas.

#### Alternative 4: Permanent Closure of Old Park to Snowmachine Use (Preferred Alternative)

Under this alternative, the Old Park (Figure 2) would be closed by regulation to the use of snowmachines. Traditional activity, within the context of the Old Park and Section 1110(a) of ANILCA, is defined in the proposed regulation and is assumed as part of this alternative.

### **Alternatives Considered and Eliminated from Further Consideration**

The NPS considered whether the park should establish a designated route for recreational snowmachine use along the Denali Park Road (Figure 4). Many national parks have established such routes, but they are limited by 36 CFR 2.18 to routes and water surfaces used by motor vehicles or motorboats during other seasons and require a special regulation for each park unit.

The Old Park has a history of non-motorized access during the winter, and snowmachine use was prohibited in the Old Park from 1970 until the passage of ANILCA in 1980. Enactment of ANILCA left this general prohibition of snowmachine use in the Old Park intact unless the snowmachine use was for the purpose of conducting a traditional activity (Section 1110(a)). Establishing a designated route through the Old Park would not serve the purposes of the proposed action because it would not avoid detriment to important park resources but, rather, would aggravate it. Establishing a designated route for recreational snowmachine use along the Denali Park Road also would be inconsistent with the park's natural and aesthetic values and management objectives. Based on the scientific studies reviewed in the 1999 Statement of



Finding for the temporary closure of most of the Old Park to snowmobiling, concentrating recreational snowmobiling along this corridor would unavoidably disturb wildlife and destroy the solitude and natural quiet in the heart of the Old Park. In addition, many areas of the road would not be safe for the operation of a snowmachine. Long stretches of the road are often blown free of snow. Some stretches of the pavement and gravel sections are under sloping ice as aufeis progresses through the winter, and some stretches are under steeply sloping wind-blown drifts that fill in the road cuts and match the existing steep terrain contours. This alternative was, therefore, eliminated from more detailed consideration in this EA.

The NPS also considered whether the Old Park could be managed as a multiple use area with snowmachine use at regulated speeds and use levels and still be consistent with its management mandates for resource protection. An allied version of this approach could use schedules such as Monday through Thursday for non-motorized users and Friday through Sunday for motorized users.

However, regulation of snowmachines would not meet the purposes of the proposed closure to avoid detriment to the Old Park's resource values. Allowing snowmobiling subject to regulation and not closure would not meet NPS goals of establishing a reasonable allocation among visitors, as well as guaranteeing the protection of the essential resource values of the Old Park. This alternative was eliminated from further consideration in part because past public comment consistently indicated that conflicts between motorized and nonmotorized users in the Old Park could not be resolved unless there are some areas where snowmachine use is completely excluded in order to prevent harm to resources. These resources include natural quiet, solitude, and the primeval character that are currently identified with the Old Park, and are critical components of many visitors' abilities to enjoy the area. It would not be feasible to limit snowmachine use numbers and speeds sufficiently to ensure with the certainty required by the NPS's protection mandate that there would not be detrimental impacts to resource values such as wildlife and vegetation, as well as the wilderness-type values of solitude and natural quiet. This type of site-specific and very restricted regulation would be impractical to implement and enforce over large areas. This approach would equate to setting aside separate areas for the conflicting motorized and non-motorized uses, which is similar to the approach evaluated in Alternative 2.

## **THE AFFECTED ENVIRONMENT**

The proposed action would affect the approximately two million acre Old Park.

The following documents contain descriptions of the environment of the Old Park. They are incorporated by reference and summarized below:

- The 1986 Denali General Management Plan (GMP), Land Protection Plan, and Wilderness Suitability Review, guides the general management of the park and the protection of park natural and cultural resources. The plan contains a review of the suitability of parklands for

wilderness preservation. It also describes the park's natural and cultural environments and existing visitor use.

- The 1988 Final Environmental Impact Statement (EIS)/Wilderness Recommendation for Denali National Park and Preserve evaluates four alternatives for additional wilderness designation within the unit. It contains a concise description of the park's natural and cultural environments and visitor use patterns.
- The 1996 Park Entrance Area and Road Corridor Development Concept Plan (DCP)/EIS amends the park's 1986 GMP. It contains an updated description of the park's natural and cultural environments and visitor use, focusing on the park road corridor.
- The 1996 South Side Denali DCP/EIS amends the park's 1986 GMP. It contains an updated description of the park's natural and cultural environments and visitor use patterns, focusing on the portion of the park and preserve which lies south of the Alaska Range.
- The 1999 Spruce Creek Access Draft EIS evaluates a proposal for improved access to a 20-acre private inholding in the Kantishna Hills of Denali National Park and Preserve. It contains updated information about resources in the Kantishna Hills, as well as summaries of parkwide resources.

## **Park Resource Information Summary**

### Climate and Snowfall

The Old Park is located in two of Alaska's major climatic zones. The Alaska Range influences climate by blocking the air that sweeps inland from the Gulf of Alaska and Bristol Bay. A continental climate is formed to the north of the range, while a transition climate is formed to the south. The north is characterized by less precipitation and greater fluctuations in temperature (hotter in summer and much colder in winter) than the area to the south.

Temperatures in winter can reach minus 60 degrees Fahrenheit during high pressure, low wind events. Cold air tends to settle down from mountain slopes so that the slopes are almost always warmer in winter than valley bottoms. Peaks above 8000 feet are above winter inversions and remain cold. Wind movement on mountain slopes increases wind chill so that the effective temperature can be much lower than in protected areas.

During late February, March, and early April, temperatures moderate and are often at, or above, freezing during the day. At park headquarters the March mean maximum is 24 degrees and mean minimum is 1 degree. The April mean maximum is 38 degrees and the mean minimum is 16 degrees. The diurnal range averages 21 degrees at park headquarters, with a higher range in the spring and summer and a lower average range in the fall and winter.

Precipitation is greater on the south side of the Alaska Range than on the north side. The average annual snowfall at park headquarters (north of the range) is approximately 80 inches, with similar amounts seen at Wonder Lake. On the south side, at Summit near Broad Pass, the average is 119 inches per year. At higher elevations in the Alaska Range, snowfall can exceed 400 inches per year. Snowfall is evenly distributed from October through February at park headquarters (average 12 inches per month), with lower averages for September, March, April, and May. Normal snowpack throughout the region averages between 20 and 40 inches by springtime, although at higher elevations the snowpack is deeper where wind and terrain allow it to accumulate.

#### Air and Water Quality

Denali National Park and Preserve is designated as a Federal Class 1 air quality area. Air quality in the park is generally very good, and no cases of exceeding the National Ambient Air Quality Standards have been documented. The exceptional air quality and lack of nearby city lights provide conditions that are outstanding for daytime panoramic views and winter night sky visibility. The park and preserve is managed to achieve the highest attainable air quality levels and visibility standards consistent with mandates specified by ANILCA, the NPS Organic Act, and the Clean Air Act.

The surface waters of Denali National Park and Preserve are generally pristine and have not been adversely affected by development. Activities in certain portions of the park have resulted in temporary, localized degradation of water quality, such as in the Kantishna Hills mining area. Analysis of surface water chemistry indicates pristine conditions in all areas studied outside the Kantishna Hills, including all watersheds in the Old Park (Edwards and Tranel 1995; Stottlemeyer and McLoone 1990). Little information exists regarding the presence, quality, or extent of subsurface aquifers.

#### Vegetation, Soils, and Wetlands

Vegetation within the park is similar to that found throughout the interior of Alaska. The five major vegetation associations within the park and preserve are low brush-bog, bottomland spruce-poplar forest, upland spruce-hardwood forest, moist tundra, and alpine tundra.

Treeline in the Old Park can range from 2000 feet on the colder soils of the broad ridges on the north side of the Outer Range to 3700 feet within tributary drainages of protected river valleys. Treeline on the southside of the park can range from 2800 feet in the Windy Creek and Cantwell Creek areas of the Old Park to approximately 1000 feet along the Yentna River in the southwest preserve. Above treeline, a shrub zone of willows, shrub birch and alders extends another 200 to 400 feet higher in elevation.

Soil types within the area vary as a result of parent material, topography, and vegetative cover. Soils in the park can be generally classified as mountain and tundra soils, bog soils, and forest soils. Mountain or tundra soils form directly from bedrock and the slow accumulation of organic matter. The sparseness of these soils is attributable to cold weather extremes and steepness of slopes. Bog soils consist of clay and glacial moraine and are poorly drained. Over time, this causes the

accumulation of plant material and often peat layers. Forested areas within the park typically have soils of sandy and silty clay with humus layers supporting mosses and lichens.

Wetlands are found throughout the Old Park except in high mountain areas. Wetland communities include riparian areas adjacent to streams and lakes, shallow tundra ponds, wet tundra, wet scrub shrub, and forested wetlands. Wetlands serve as important resting, feeding, and nesting areas for resident and migratory birds, as well as important foraging areas for large mammals such as moose.

Permafrost is intermittently present throughout the lowlands north of the Alaska Range and is continuous at higher elevations both north and south of the range. Detailed studies of the extent of permafrost in lowland areas to the south of the range have not been made, but during the construction of wells, roadcuts, and other past developments within the region permafrost has been found at varying depths.

Permafrost essentially consists of soil, rock, or other earth materials at a temperature of 32 degrees Fahrenheit or colder for two or more consecutive years. A delicate balance exists between permafrost and the active layer above it. Thus, changes in the vegetative mat, snow, or other characteristics of the upper layer can significantly alter the thermal regime with resultant changes at ground level. For example, removal of vegetation increases the release of heat from the ground in the winter and allows increased heat absorption into the ground in summer, and this can cause the melting of permafrost. In addition, an increase in solifluction, or soil movement, is possible. These phenomena can cause heaving, sagging, soil slumping, and erosion at the surface during successive periods of freeze and thaw in the active layer.

#### Wildlife Values and Habitat

Two primary reasons Mount McKinley National Park was established in 1917 were to protect the outstanding assemblage of wildlife resources and to allow natural processes to continue unaltered by human activities. Outstanding opportunities exist to view Dall sheep, caribou, grizzly bear, and moose, as well as more elusive species such as wolves, lynx, and wolverine, in natural settings. Denali supports a large mix of smaller carnivores including coyote, red fox, river otter, marten, and least weasel; rodents including arctic ground squirrel, red squirrel, hoary marmot, northern flying squirrel, beaver, muskrat, porcupine, red-backed vole, tundra vole, northern bog lemming, two lagomorphs, snowshoe hare, collared pika; and insectivores including masked shrew.

Denali is also home to a variety of subarctic breeding birds and offers visitors unique viewing opportunities of these species. Park visitors can observe gyrfalcon, northern goshawk, northern hawk owl, great grey owl, northern shrikes, and three species of ptarmigan. A suite of neotropical and paleotropical migrants, including northern wheatear, arctic warbler, blackpoll warbler, merlin, and peregrine falcons, and over 130 species of other migratory birds, including golden eagles, American dippers, long-tailed jaegers, surfbirds, and harlequin ducks, breed each season in Denali.

Moose—Moose habitat in the Old Park is typically vegetated habitat below the 4000 foot elevation. Open and closed shrub communities are the preferred habitat. The overall population north of the range has remained relatively constant since 1986, with overall densities of 0.4-0.5 moose per

square mile. However, moose densities vary geographically from about 1.0 moose/sq. mile in the eastern foothills to 0.1 moose per square mile in the northwestern spruce flats. South of the range, moose are more abundant within broad drainages. Moose are hunted throughout the south side of the range during September and, in some areas, the hunting season remains open through part of the winter. Most calving takes place from about 5 May to 5 June.

Caribou—The Denali caribou herd numbers approximately 2000 animals and ranges over most of the area north of the range and areas south of the range east of Mount McKinley. Calving since 1980 has mostly occurred in the foothills north of the slopes of Mount McKinley. During the 1970's, calving and post-calving centered on the area between Cantwell and the West Fork of the Chulitna. Calving occurs from about 5 May to 1 June with over 75 per cent of the calves born during the first two weeks of the calving season.

Important caribou winter ranges include the Stampede flats just north of the Old Park and treeline areas in the vicinity of Slippery Creek, Birch Creek and the Foraker River within the Old Park. In years of low snowfall, caribou tend to winter at lower elevations in these areas, whereas when above average snowfalls occur they are more likely to use windblown ridges outside the Old Park along the north side of the Outer Range, the Stampede Hills, and the Kantishna Hills.

Grizzly and Black Bears—Both grizzly and black bears inhabit the Old Park. Grizzly bear density for most of the park north of the Alaska Range is estimated at 37 per 1000 square kilometers, or about 200 bears in the 7000 square kilometer study area (USGS, unpublished, 1995). There are no grizzly bear and black bear density estimates for the Old Park areas south of the crest of the Alaska Range, but grizzly bear and black bear density for the Dunkle Mine and Tokositna areas of the park is estimated roughly as low to medium (South Side Denali DCP/EIS, NPS, 1996). Preferred habitat for black bear is forested areas. Grizzly bears are most often found in high elevation tall shrub, low shrub, and alpine tundra communities.

Most park grizzly bears den in high alpine areas and are dormant from October until April. Adult male bears can emerge from their dens anytime after 1 April. Females with cubs often emerge later in April and May. Upon emerging from their dens, grizzly bears often seek winter-killed ungulates and newborn young of ungulates (i.e., moose and caribou) and Dall sheep.

Wolves—Wolves, usually within packs, exist in and out of the park on both sides of the Alaska Range. The number of wolves in Denali National Park and Preserve was approximately 80 in March 1998, with most of them active in the Old Park. The young are born from late April through mid-May in dens excavated into hillsides. During periods of low winter snowfall, when prey are in good nutritional condition, wolf numbers tend to drop due to low pup production and survival, and high dispersal and mortality of older wolves. When winters are severe and prey is more vulnerable, the wolf population can quickly increase by higher pup production and reduced dispersal of young adults. For example, the park's wolf population more than doubled during 1987 through 1990 when winter snowfalls were particularly severe (Spruce Creek Access Draft EIS, 1999).

Dall Sheep - Sheep populations have remained stable in the Old Park for the past few decades with declines in some years of heavy snowfall offset by increases in other years. Alpine slopes to 6000 feet are productive habitat in summer. Sheep require areas with windblown or thin snowcover for grazing grasses and browsing dwarf shrub vegetation in winter.

Snowshoe Hares and Lynx —Snowshoe hares live in forested and tall shrub habitat within the Old Park. Their population follows a 7 to 11 year cycle. Lynx primarily feed on snowshoe hare. Snowshoe hare abundance also influences golden eagle productivity in Denali (McIntyre and Adams, 1999). Lynx and other predator/raptor populations may decline during the lows of the hare cycle. Lynx hunt near snowshoe hare trails, using concealment and quiet patience to surprise foraging hares. Both predator and prey have evolved large feet to spread their weight on the snow surface.

Ptarmigan —Three ptarmigan species (willow, white-tail and rock ptarmigan) are abundant in the Old Park. Ptarmigan often use willow thickets associated with riparian areas in winter. These birds are an important food source for wintering raptors and breeding raptors, such as golden eagles, in spring. Ptarmigan often protect themselves from the deepest winter cold by burrowing into the light snow and using the snow as additional insulation.

Wolverine —These large weasel family members occur in alpine and other areas of Denali National Park and Preserve. Wolverines scavenge carcasses and hunt marmots and other small mammals and birds. They have also been observed chasing larger predators off of kills. No estimate of their numbers has been reported for Denali, including the Old Park, but they have been seen throughout the Old Park in summer, and backcountry travelers regularly see their tracks in winter.

### Cultural Resources

The Denali region of Alaska has fostered a rich prehistory and history of human occupation. The exact extent of human activity is not yet fully known. Early bands of inhabitants were likely migratory, following herds such as caribou, and leaving scanty remains at their temporary camps and game lookout points.

Miners of gold and other metals and minerals, such as silver and antimony, have historically criss-crossed the Alaskan backcountry and founded communities, leaving isolated workings behind. The historic mining community of Kantishna in the northern park additions presently has no operating mines or winter residents, although summer lodge operations interpret the cultural mining heritage of the area to 10,000 visitors each summer. Many historic structures in Denali National Park and Preserve have been found eligible for inclusion on the National Register of Historic Places. Since 1917, administration of the Old Park has depended on ranger patrol cabins, both along the park road and inside the perimeter of the Old Park. Fifteen of these historic cabins are either on the National Register of Historic Places or are eligible for nomination.

### Recreation, Visitor Use, and Wilderness Values

The health of Denali National Park and Preserve's naturally-regulated ecological system is the foundation for one of the world's finest wildlife viewing opportunities. The possibility of seeing

bear, wolves, caribou, moose, Dall sheep, and other animals against the backdrop of a spectacular subarctic, alpine landscape and vegetation is the cornerstone of a multimillion-dollar tourism industry in Alaska. Wildlife populations in the Old Park are available for unparalleled viewing opportunities precisely because they have been protected for decades from intrusive interactions with humans. The opportunity to see natural predator-prey interactions is one of the primary visitor attractions at the Old Park.

The primary visitor activity is a shuttle or tour bus ride along the Denali Park Road. Bus trips offer excellent opportunities to view wildlife, and on a clear day, provide spectacular views of Mount McKinley. Approximately 80 per cent of the close to 400,000 park visitors arrive in June, July, and August, and more than 95 per cent of visitation is along the park road corridor.

Visitation from October to April is light. There were approximately 1400 visitors recorded in 1998/1999 during these months. (NPS monthly public use reports, unpublished). This number derives generally from visitor contacts in the park headquarters area and in the backcountry. Visitation likely is undercounted because visitor counting is not occurring at this time of year in the same way as it is during summer. Use of the Old Park for winter activities is limited by the distance to population centers, few daylight hours, and cold weather. Use by skiers, dog mushers, and other visitors increases in the spring. During the 1990's, park dog mushing patrols have contacted between 100 and 200 skiers and dog mushers annually along interior routes paralleling the Denali Park Road, the Windy Creek/Foggy Pass areas, or on the northern route through the Stampede/Clearwater Fork corridor to Kantishna and Wonder Lake. (Park staff reports, unpublished)

The number of possible entry points by snowmachine into Denali National Park and Preserve and the speed by which snowmachine users travel make it difficult to contact users and make accurate estimates of use in the park. Counts of vehicles at the George Parks Highway pullouts adjacent to the park in 1999 indicated an estimate of at least 1500 to 2000 visits by snowmachine users in March and April, especially in the southern park additions either in the Cantwell to West Fork of the Chulitna River area or Tokositna River area. Approximately six snowmachine groups used the corridors in the Old Park left open during the 1999 temporary closure (NPS, unpublished, 1999).

The Wilderness Act of 1964 (P.L. 88-577) describes wilderness as an area "untrammelled by man without permanent improvements or human habitation, which is protected so as to preserve its natural conditions with the imprint of man's work substantially unnoticeable [with] outstanding opportunities for solitude or a primitive and unconfined type of recreation." Other specified mandates include administration of the wilderness areas to leave them as "undeveloped Federal land retaining its primeval character and influence" "unimpaired for future enjoyment as wilderness" with "no form of mechanical transport."

Section 701 of ANILCA designated about 95 per cent of the Old Park as Denali wilderness. The Old Park provides outstanding opportunities for primitive unconfined recreation, including nature study, backcountry camping, wilderness and wildlife photography, mountain climbing, cross-country skiing, snowshoeing, and dog mushing. The Old Park is one of the few places in Alaska where visitors of all ages and abilities can experience wilderness first-hand. In summer,

visitors can experience the wilderness on its own terms or have an opportunity to confront it in a safe and controlled environment from a bus on the park road. In winter, when the park road is closed to motorized traffic, all contact with the wilderness comes with the expectation that motorized vehicles will not be used to make access easy and that mechanized equipment will not be used to limit the impacts of the elements on one's visit.

Denali National Park and Preserve's Statement for Management identifies the park's wilderness recreation values:

Denali offers superlative opportunities for primitive wilderness recreation. Outstanding cross-country hiking, backcountry camping, and winter touring possibilities are available for one willing to approach the area in its natural condition. This huge park contains large, almost entirely trailless areas where evidence of human use is minimal to nonexistent. These backcountry conditions are in contrast to most Lower 48 wilderness areas where maintained trails, designated campsites, footbridges, and signs are the norm. (Statement for Management, Denali National Park and Preserve, September 1995, p.11)

The Old Park provides a unique resource to those members of the public who seek solitude, natural quiet, and a non-motorized winter recreational experience because it is relatively accessible, compared to the rest of Alaska. Low density, non-motorized winter recreation has developed in this area through the last 82 years of NPS management. There is no other similar large, naturally-regulated ecosystem in the entire 375 million acres of Alaska that is as free from motorized use in the winter months.

Furthermore, Denali National Park and Preserve fills a special gap on the nationwide recreation opportunity spectrum.

All national park system units, by virtue of planning and administrative decisions, fall somewhere in that spectrum, which ranges from highly pristine, remote and sparsely used lands to highly developed, readily accessible, and intensively used recreation areas. Denali's legislative mandates and administrative history place the park toward one end of that spectrum with parks that can be characterized as wild, rustic, and expansive. Denali rests somewhere between the extremely remote, lightly used Alaska national park units and the large, wilderness parks of the Lower 48 states that are highly accessible and more developed. (Ibid. at p.9)

Snowmachine use in and near the Old Park area began to increase in the early 1990's. This increased use occurred simultaneously with an increase in snowmachine sales and use throughout Alaska. In addition to increased snowmachine activity, the character and pattern of the use also changed. Snowmachine manufacturers began production of more reliable, higher performance vehicles that could access steep terrain and travel greater distances. Snowmobiling changed from a utilitarian form of access into a new and popular recreational activity in and of itself. During the past 6 years, this change in the type of use, the increased capability and



reliability of snowmachines, and the increased numbers of snowmachine users, have resulted in numerous incursions into the Old Park in a limited number of drainages on the south side of the Alaska Range.

#### Subsistence Use

Subsistence activities are not permitted in the Old Park. See Appendix A.

#### Park Management.

The management of Denali National Park and Preserve is guided by the 1916 NPS Organic Act, which establishes the legal framework for management of the entire national park system, and directs the Secretary of the Interior and the NPS to manage national parks and monuments to "conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

The establishment of Mount McKinley National Park by Congress in 1917 was meant to protect this unique resource from new types of use brought on by rapid changes in technology and access, such as the construction of the Alaska Railroad and the market hunting for Dall sheep.

Park management also is guided by the 1978 Amendments to the NPS Organic Act (92 Stat. 163), which expressly articulate the role of the national park system in the effort toward ensuring ecosystem protection and state: "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, except as may have been or shall be directly and specifically provided for by Congress." Other direction can be found in executive orders, laws, and regulations including: the National Parks and Recreation Act of 1978, the Clean Air Act, Executive Orders 11644 and 11989, and NPS regulations (36 CFR 2.18(a), (b), and (d)).

In compliance with its statutory mandates, including the park's enabling legislation, and agency policies, Denali National Park and Preserve, is managed: to provide protection for geologic, scenic, wildlife, habitat, and water resources and unaltered ecosystems; to provide for subsistence opportunities in the ANILCA additions; to maintain opportunities for scientific research in undisturbed ecosystems; to preserve wilderness resource values; and to provide for recreational opportunities by the visiting public.

The primary purpose of Denali National Park and Preserve and, in particular the Old Park, is to protect the intact and naturally-functioning subarctic ecosystem, which has outstanding opportunities for wildlife viewing and wilderness recreation (Strategic Plan for Denali National Park and Preserve, 1997). The legislative history of ANILCA directed that the Old Park was "intended to be [a] large sanctuar[y] where fish and wildlife may roam freely, developing their social structures and evolving over long periods of time as nearly as possible without the changes that extensive human activities would cause." (Report of the Senate Committee on Energy and

Natural Resources, Report No. 96-413, p.137) This purpose has been supported repeatedly in discussions with the public during the development of recent park planning documents (i.e., South Side Denali Development Concept Plan (DCP) and Park Entrance Area and Road Corridor DCP). The area of the Old Park is one of the most important natural areas in the world because it has been protected from most consumptive or otherwise altering uses for more than 82 years, and still functions as a naturally-regulated system.

One of the greatest long-term values of the Old Park is the possibility of recording and gaining understanding of a naturally-functioning subarctic system. This largely undisturbed area is regularly referred to as a comparison site in scientific studies throughout the circumpolar region. The Old Park has been designated an International Biosphere Reserve for its unique scientific values. It has also been selected for long-term ecological monitoring by NPS and other federal agencies because of its historic level of protection and ecological integrity.

Key management factors over the last thirty years that have contributed to retaining the opportunity to see the unparalleled array of Alaska wildlife from the Denali Park Road include the policies of: 1) restricting private vehicles on the park road in the summer, 2) continuing the prohibition of snowmachine use in the Old Park in the winter, 3) limiting and educating backcountry users, and 4) encouraging the dispersal of backcountry users.

## Impact Table

Issues	Alternatives			
	1 -- No Action	2 -- Partial Closure	3 -- Temporary Closures	4 -- Permanent Closure
<b>Air and Water Quality</b>	Snowmachine use would diminish the Old Park's high level of air and water quality. Localized high readings of carbon monoxide would occur near operating snowmachines.	The same impacts as Alternative 1 but limited to and concentrated in a 180,000-acre area.	No impacts are anticipated.	No impacts are anticipated.
<b>Vegetation, Soils, and Wetlands</b>	<p>Damage from snowmachine use is likely at some locations due to low and non-uniform snow cover.</p> <p>Snowmachine use would result in artificial changes in soil temperature, soil moisture content, and vegetation species composition on routes used repeatedly.</p> <p>Snowmachine use would increase the creation of permanent trails, soil erosion, and damage or loss of vegetation. Continued use would delay recovery once the damage to soils and vegetation occurred. Damage would be greatest for those meadows and open slopes on the south side of the park, where multiple adjoining trails developed.</p>	The same impacts as Alternative 1 but limited to and concentrated in a 180,000-acre area.	No impacts are anticipated.	No impacts are anticipated.
<b>Wildlife Values and Habitat</b>	<p>Some amount of intentional and unintentional harassment of animals likely would be unpreventable.</p> <p>Stress would increase for park wildlife in winter, especially when deeper or crustier snow cover makes travel difficult for wildlife but easier for snowmachines.</p> <p>Wintering bird populations would be disturbed by snowmachines. Stress due to human disturbance during nesting activities for early migratory species could cause nest abandonment.</p> <p>Denali's small mammal population could be adversely affected, depending on the amount of snowmachine use in the Old Park.</p>	The same impacts as Alternative 1 but limited to and concentrated in a 180,000-acre area.	No impacts are anticipated.	No impacts are anticipated.

## Impact Table (cont.)

### Issues

### Alternatives

	1 -- No Action	2 -- Partial Closure	3 -- Temporary Closures	4 -- Permanent Closure
<b>Cultural Resources</b>	Anticipated increases in snowmachine use would increase the opportunity and potential for vandalism and destruction of cultural resources.	The same impacts as Alternative 1 but limited to the two cabins near Windy Creek.	No impacts are anticipated.	No impacts are anticipated.
<b>Recreation, Visitor Use, and Wilderness Values</b>	Increased snowmachine use would curtail or eliminate the opportunity for non-motorized recreation in the Old Park, which is dependent on natural quiet, solitude, and natural vistas.	The same impacts as Alternative 1 but limited to and concentrated in a 180,000-acre area.	Same as Alternative 4.	Loss of the opportunity to operate a snowmachine in the Old Park would be a negative effect for those who desire that experience and a positive effect for those who desire an experience devoid of mechanized equipment. However, since the vast majority of Alaska accessible from the road system is presently open to snowmachine use, this loss would not be significant.  Those individuals desiring an experience in the park within the guidelines and expectations of the Wilderness Act would have an area available.
<b>Subsistence Use</b>	Increased traffic to the Old Park, originating mostly in Broad Pass, would diminish subsistence opportunities for small game and trapping in the park additions.	Increased traffic to the Old Park, originating mostly in Broad Pass, would diminish subsistence opportunities for small game and trapping in the park additions.	Same as alternative 4.	Snowmachine use would be redirected to park additions and areas east of the Parks Highway. No impacts are anticipated to subsistence opportunities.

## Impact Table (cont.)

Issues	Alternatives			
	1 -- No Action	2 -- Partial Closure	3 -- Temporary Closures	4 -- Permanent Closure
<b>Park Management</b>	<p>Park-specific studies would be required regarding the effects of snowmachine use on wildlife, vegetation, wilderness resources, and conflicts with other winter visitors. Additional funding would be required to accomplish these studies.</p> <p>A public information and education effort focussed on safe use of snowmachines and resource protection and preservation would be needed. Additional funding could be required to conduct this outreach effort.</p> <p>Enforcement of regulations to promote safe operation of snowmachines in a park, published at 36 CFR 2.18, would require staffing above existing levels. Additional funding would be needed.</p>	<p>The same impacts as Alternative 1 but limited to and concentrated in a 180,000-acre area.</p> <p>A public information and education effort would be needed similar, but perhaps reduced in scope, to that required for the no action alternative.</p> <p>An increase would be anticipated in expenditures to enforce the snowmachine closure in the majority of the Old Park. Additional funding may be needed to accomplish this, but not as much as for Alternative 1.</p>	<p>Same as Alternative 4, except additional staff time and effort would be required to renew the closure each year.</p>	<p>An increase in expenditures would be anticipated to enforce the snowmachine closure in the Old Park. Additional funding may be needed to accomplish this, but not as much as for Alternatives 1 and 2.</p>

## **ENVIRONMENTAL CONSEQUENCES**

### **Introduction**

This section describes the environmental consequences of each of the four alternatives. Because impacts under the No Action Alternative would be the most in type, magnitude, and intensity, the environmental consequences of that alternative are described in most detail. The consequences of the other alternatives generally are described in comparison to those of the No Action Alternative.

Under Section 1110(a) of ANILCA, as well as other laws, NPS has a responsibility to ensure that any new activity or change in existing activities does not have a detrimental effect on resource values. Section 1110(a) provides for closure by the Secretary of the Interior if use "would be detrimental to the resource values of the unit or area." Thus, in meeting its responsibilities, NPS need not wait for actual physical damage to occur before taking protective action to prevent degradation to wildlife and other natural resources.

An evaluation of the rapid changes in the level, type, and pattern of snowmachine use is necessary at this time to insure that the resource values of the Old Park are being adequately protected relative to this change. Local studies related to specific conditions found in the Old Park would be the best information on which to base this evaluation, but the growth in snowmachine use is so recent that local studies in Alaska are just now being conducted. Much of the available research data on snowmachine effects comes from areas outside of Alaska where the level of use increased as early as the late 1960s. This increase caused concern for resource values and created conflict among user groups. Consequently, this is the available information base that was primarily used in this evaluation.

Despite the lack of local studies, legitimate conclusions can be drawn by combining existing information on the resources of the Old Park and observations of increasing snowmachine use there in recent years with the available research on snowmachine effects gathered in other areas. Research on snowmachine effects was reviewed to identify the primary mechanisms of impact such as changes in animal activity levels or habitat use, alterations of plant growing conditions, or noise intrusion on other user groups. These predominant mechanisms of impact were then compared with the local studies and the previously described resource values of the Denali area to see if there was a significant likelihood of similar interactions. Sufficient similarities were found to support the conclusion that the results from other research are transferable to the assessment of probable impacts from increased snowmachine use in the Old Park, and that the evaluation of impacts in this EA could be conducted using this information.

### **Cumulative Effects Considerations**

Cumulative effects are defined as the incremental impacts on the environment resulting from adding the proposed action (or alternative) to other past, present, and reasonably foreseeable future actions. Cumulative impacts may result from singularly minor but collectively significant actions taking place over a long period of time (CEQ sec. 1508.7).

The following activities have, are, or may reasonably be expected to occur and contribute to cumulative effects. The effects of these actions are evaluated, as applicable, in the cumulative effects analysis for each alternative, and the increment of effect the proposed action (or alternative) contributes to cumulative effects is identified.

North of the Alaska Range, where air quality sampling has been ongoing in Denali since 1980, anthropogenic pollution is consistently worse in the late winter and early spring than in summer, when most park visitation occurs. While the amount of pollution is small relative to most rural areas of the contiguous 48 states, the seasonal pattern is indicative of a circumpolar pollution phenomenon called arctic haze. Originating primarily from industrial sources in the mid- to high latitudes of Europe and Asia, arctic haze contains sulfates, nitrates, heavy metals, pesticides, and other contaminants (Shaw, 1995). There also is growing evidence that in the spring, Asian pollutants are transported to Denali via pathways separate from those associated with arctic haze (Catherine Cahill, pers. comm.)

Recreational use of the Old Park accelerated after the completion of the George Parks Highway in 1972. A backcountry unit system, with overnight limits, went into effect in 1974 for areas of the park north of the Alaska Range and between Windy Creek and the West Fork of the Chulitna River on the south side of the Alaska Range. The backcountry units have not had significant increased use by backpackers since the late 1970s because the system has been near capacity each summer night. No major alterations to the current hiking use levels are anticipated. The south side units of the Old Park remain the most underused within the system. Summer day hiking continues to increase, although most day hiking is within two miles of the park road.

No guiding currently exists or is anticipated for winter touring by motorized vehicle in the park. Three concession permits have been issued within the past two years for dog sled operations into the Old Park and park additions. Use under these permits has been light, although at full use not more than one party at a time would be expected to be along the road corridor west of the Savage River, with a similar level of use in the northwestern park and preserve additions.

The most significant anticipated change is the continued increase in recreational snowmachine use, particularly in the park additions. Changes in technology will continue to make this form of winter access more useable for larger numbers of people. These changes, in combination with increased marketing of winter tourism as well as general population growth within Alaska, create a high probability for more snowmachine use in the area.

Vehicular access in the Old Park is presently limited to the George Parks Highway and 3 miles of the park road to headquarters between October 1 and late March. Sometime in late March, the park road begins to open, as the snow is plowed and ice is removed. The park road generally is not entirely open until late May. No changes to this pattern are planned.

### **Alternative 1: No Action**

Under this alternative, there would be no change from current management practices. Snowmachine use would continue to grow, especially on the south side of the park. Snowmachine use would increase in the Old Park, and the absence of a definition of traditional activity would make it very difficult to limit it to specific uses. The impacts of current and anticipated snowmachine use on park resources are described below.

#### Air and Water Quality

Impacts to air and water quality are summarized in Table 3-1.

**Table 3-1 Summary of Air and Water Quality Impact Causes and Effects**

<b>Impact Cause</b>	<b>Effect on Air and Water Quality</b>
Snowmachine emissions	Air and water pollution in the Old Park from carbon monoxide, hydrocarbons, and other pollutants emitted by snowmachines.

#### General Impacts to Air and Water Quality

Snowmachine use has negative effects on air quality. Snowmachine emissions include hazardous air pollutants and volatile organic compounds. Snowmachine two-stroke engines emit about 30 per cent of the consumed fuel unburned through the exhaust (Hagemann and VanMouweik, 1999). Snowmachine hydrocarbon emissions far exceed emissions from most other motor vehicles (Fussell, 1997). The U.S. Environmental Protection Agency estimates that snowmachines and all-terrain vehicles (ATVs) produce about 15 per cent of all hydrocarbons emitted by mobile sources (U.S. EPA, 1999). Snowmachine use also contributes to pollution from refueling, accidental spills, and on-trail maintenance.

Measurement of operating snowmachine exhaust has shown carbon monoxide measurements that are about 1,000 times higher than automobile exhaust under similar operating speeds (Fussell, 1997). The two-cycle engines used in snowmachines are known to emit high levels of hydrocarbons in the exhaust. Discharge from these two-stroke engines can lead to indirect pollutant deposition into the top layer of snow and subsequently into the associated surface and ground water (Adams, 1975; Ferrin and Coltharp, 1974). Hagemann and VanMouwerik (1999) found that there is a potential risk to aquatic life from snowmachine emissions but that the risk could not be quantified because of a current lack of water quality data. A study by Adams (1975) showed that high concentrations of lead and hydrocarbons were found in pond water adjacent to trails during the week following ice-out. This study also found that "fingerling brook trout showed lead and hydrocarbon uptake from surface water and food chain feeding as well as reduced stamina.

#### Specific Impacts to Denali's Air and Water Quality

Localized, short-term high concentrations of carbon monoxide and other air pollutants would occur in areas where snowmachines were used. Snowmachine use would diminish the Old Park's air quality. This diminishment of air quality likely would be below the federal standards for pollution. However, those standards do not consider that most backcountry areas of Denali have



had little exposure to pollution. Those standards do not take into account that many of Denali s visitors come to the park with high expectations of being in a non-polluted area. Public testimony leading up to the current temporary closure specifically mentioned that detrimental effects from snowmachine exhaust limited the ability to enjoy the park. Any diminishment of air quality, even if measurements are below the standard level of pollution, becomes extreme to those visitors.

Unburned hydrocarbons would accumulate on the snow surface and eventually wash into streams and lakes. This could cause localized degradation of the high water quality of the Old Park. This diminishment to water quality likely would be below the federal standards for pollution, but additional research is needed to establish that standards are not being violated. Also, those standards do not consider that most backcountry areas of Denali have had little exposure to pollution and that many of Denali s visitors come to the park with high expectations of being in a non-polluted area. Any diminishment of water quality, even if measurements are below the standard level of pollution, becomes extreme to those visitors.

Even minor impacts to water and air quality from non-point source pollution would have impacts on the current importance of the Old Park as a significant site for long-term monitoring. In addition, these impacts would be contrary to the air quality management objective of non-degradation of pristine areas.

#### Cumulative Effects

Pollution from snowmachine traffic would be in addition to the pollution contributed by busses, administrative traffic, and transport of industrial pollutants from Eurasia. In winter, snowmachines likely would be the largest contributor to adverse air quality in the Old Park. No other water pollution sources besides snowmachines have been identified for the backcountry in the Old Park. The ability to use Denali as a long-term reference site for pollution studies would be compromised by the addition of pollutants from snowmobiling.

#### Vegetation, Soils, and Wetlands

Impacts to vegetation and soils are summarized in Table 3-2.

**Table 3-2 Summary of Vegetation, Soils, and Wetlands Impact Causes and Effects**

<b>Impact Cause</b>	<b>Effect on Vegetation, Soils, Wetlands</b>
Snowmachine use in vegetated areas	<ul style="list-style-type: none"> <li>• Changes in species composition and plant density.</li> <li>• Abrasion and breakage of exposed vegetation, including seedlings, shrubs, and young trees.</li> </ul>
Snowmachine trail creation and snow compaction	<ul style="list-style-type: none"> <li>• Indirect impacts from compacted trails formed by snowmachines affecting the subnivean environment by causing temperature reductions and changes in snowpack characteristics and subsequent impacts on vegetation, including wetland vegetation.</li> <li>• Compacted winter trails would cause snow melt delay, deeper frost penetration, and delay or preclusion of seed germination.</li> <li>• Sensitive permafrost soils could be damaged.</li> </ul>

- |  |  |
|--|--|
|  | <ul style="list-style-type: none"> <li>• Typical low precipitation north of the Alaskan Range could result in insufficient snow cover to protect resources.</li> </ul> |
|--|--|

### General Vegetation, Soils, and Wetlands Impacts

Snowmachines can cause considerable abrasion and breakage of exposed vegetation, including seedlings, shrubs, and young trees (Neumann et al., 1974) (Photo 2). Even when there is adequate snowcover to prevent direct abrasion of vegetation, the compacted trails formed by snowmachines affect the subnivean environment by causing major temperature reductions and changes in snowpack characteristics (Pesant et al., 1985). These changes alter species composition, change plant density, delay the melting of compacted winter trails, and provide moisture over a longer period of time to the vegetation in the trail area (Pesant et al. 1985). Changes in moisture and growing season are important in a northern environment where the growing season is already extremely short. These temperature reductions can change soil surface microstructure, which reduces the suitability of a site for seed germination, the storage organs of perennial plants, and spring flower viability (Wanek and Schumacher, 1975; Keddy et al., 1979).

Wanek and Schumacher (1975) also reported:

Temperature data collected over the past years have clearly established that the environment beneath the snow compacted by snowmachines is substantially colder than that under natural snow cover. Even during comparatively mild winters, plant growth and flowering is retarded. During winters of average severity, large numbers of perennial herbs having fleshy subterranean organs are likely to perish where snowmachines travel. This mortality is due to significantly colder soil temperatures producing intracellular ice crystals which cause cytolysis, tissue dehydration, or extracellular ice masses which disrupt tissues.

Other investigators (Keddy et al., 1979) report that adverse effects to subarctic ecology may result from snow compaction, which would affect the availability of seeds and modify subnivean rodents' seed predation patterns. Rongstad (1980) also reported delayed flowering and lower soil bacteria and elimination of some plants due to snow compaction.

Soil compaction increases surface runoff, reduces infiltration, and impedes gas exchange between soil and air. Compacted soils inhibit root growth and adversely affect soil organisms.

(D)irect mechanical effect of snowmachines on vegetation at or above the snow surface can be severe. The most significant effects include death of saplings or broken leaders of young plantation trees covered by snow; breakage or abrasion of woody stems and trunks; bruising and stripping of bark of pliable stems; and damage to exposed tree roots. These effects result in increased susceptibility to desiccation. These effects ...are more commonly associated with off-trail (snowmachine) riding (Ontario Federation of Snowmachine Clubs, 1994).

Greller (1974) found that one source of destruction is the scraping of the soil, where snow is lacking, by the skis and rubber/metal tracks. This removes soil lichens, rock lichens, and causes damage to leaves and stems of other plants.

One study on snowmachine impact to vegetation has been conducted in Alaska (Tietz, 1996). The study did not find a loss of vegetative cover from only one season of snowmachine traffic. While the study is important because it was conducted in Alaska, the methodology differs from the other studies previously discussed. No measurements of the vegetation that was actually subjected to snowmachine traffic were taken prior to applying the use. The assessment that there was no damage was based on an extrapolation from surrounding vegetation. No measurements were taken to see if the compacted snow observed in the experimental treatment trails remained on the vegetation longer than the snow that was adjacent to the trail. Also no soil temperature data was collected. The results of this work are not sufficient to say that the impacts observed in other areas would not also occur in Alaska.

#### Denali Specific Vegetation, Soils, and Wetlands Impacts

Staff observations of snow pack conditions at Denali indicate that adequate snow cover to protect vegetation does not occur uniformly over an area. This is due to variation in terrain, snow depth, and snow pack characteristics such as crusts, snow density, or layers within the snowpack. Therefore, any level of use allowed in the Old Park likely would cause damage to vegetation at some locations.

Simply having enough snow to cover vegetation may not be adequate to protect vegetation. Staff observations of the snow conditions at Denali indicate that snowmachine tracks may sink down well into snowpack depending on the characteristics of the snowpack. Consequently, vegetation that may appear to be protected actually may be susceptible to abrasion.

Field observations in the Denali area show that the snowpack lasts longer and is more compacted and dense in snowmachine trails (Photo 3). Trail formation would adversely affect the Denali ecosystem by creating artificial changes in soil temperatures and moisture content and vegetation species composition along routes used repeatedly. Where the snow depth is shallower, such as is generally the situation on the north side of the Alaska Range or in wind-scoured snow free zones, widespread damage to exposed soil, plants, and lichens likely would occur.

Use across open areas, such as meadows, lakes, or open slopes, typically is not confined to single narrow corridors. Staff observations indicate that snowmachine use often occurs in the form of multiple parallel trails, in some cases as much as 100 meters wide and extending for over 2 miles (Photos 4 and 5). The expansiveness of these trail corridors multiplies the potential impacts of snowmachine use on vegetation and soils.

Impacts from snowmachine use to the sensitive vegetation and permafrost soils of the subarctic found in the Old Park would increase the creation of permanent trails, soil erosion, damage or loss of vegetation, and the delay or permanent prevention of recovery once the impact to soils and vegetation occurred.

### Cumulative Effects

The vegetation, soils, and wetlands of the Old Park are subject to air and water pollution from motorized vehicles within the park. The impacts to vegetation from the summer use of vehicles in the park are limited to the road corridor and are largely unchanged in magnitude since the road was built 70 years ago. Vegetation growing on the park road fill slopes or backslopes tends to grow faster due to increased soil warmth and road runoff, although this impact is restricted to the road corridor. Vegetation impacts from off-road hiking is at equilibrium due to limits which have stabilized use for the past 20 years.

Most damage to vegetation, soils, and wetlands would be from increasing snowmachine use. No mechanized vehicles in the backcountry of the Old Park other than snowmachines come in direct contact with the vegetation and soils. Snowmachine use would represent a widespread new source of impacts to vegetation from human use in the backcountry. If trails through vegetation, such as willows, were created through winter snowmachine use, those trails could be selected for use by summer hikers, creating more use and damage along trail corridors.

### Wildlife Values and Habitat

Impacts to wildlife distribution, abundance, behavior, and their habitat consistently have been identified as major concerns by the public and in the scientific literature. Impacts are summarized in Table 3-3.

**Table 3-3 Summary of Wildlife Values and Habitat Impact Causes and Effects**

<b>Impact Cause</b>	<b>Effect on Wildlife</b>
Snowmachine noise, odor, and vehicular intrusion into wildlife habitat	<ul style="list-style-type: none"><li>• Stress resulting from intrusion could cause wildlife to abandon their preferred habitat.</li><li>• Wildlife flight response to snowmachines would result in adverse stress and energy expenditure during the winter season when energy expenditure can already be high.</li></ul>
Snowmachine trail creation and snow compaction	<ul style="list-style-type: none"><li>• Snowmachine tracks compressing the snow could adversely affect subnivean animals by creating snow barriers to movement or a loss of individual animals.</li><li>• Compacted trails would change distribution patterns by providing energy efficient travelways.</li></ul>
Snowmachine collisions and intentional harassment of wildlife	<ul style="list-style-type: none"><li>• Wildlife may abandon their preferred habitat.</li><li>• Individual animals may be killed or injured.</li></ul>

Snowmachine impacts to wildlife can be both direct and indirect. Direct impacts include intentional harassment, injuring, and killing of wildlife. Indirect impacts include stress from disturbance, changes in distribution, and elimination of use of preferred habitat.

### Direct Impacts on Wildlife Values and Habitat

Some direct impacts from harassment (stress, displacement, abandonment of preferred habitat), both purposeful and unintended, would be unavoidable under this alternative. The large area that would be open to travel would make the prevention of intentional harassment through patrols essentially impossible. The random cross-country nature of travel and the rates of speed that likely would occur would make unintended harassment of wildlife inevitable.

#### General Stress Impacts on Wildlife Values and Habitat

Natural effects (e.g. weather and predators) or anthropogenic effects (i.e., human-influenced) may have an influence upon an animal's energy balance or stress level which may, in turn, influence survival, productivity, and immune function. Several studies have been conducted that show the direct impact of repeated snowmachine use on wildlife behavior and levels of physiological stress (Aune, 1981; Dorrance et al., 1971; Freddy et al., 1986; Moen et al., 1982; Neumann and Merriam, 1972; Rudd and Irwin, 1985; Simpson, 1987; Tyler, 1991; Voyageurs National Park, 1996). Many of these studies showed behavioral effects on the same species that occur at the Old Park area of Denali. These studies indicate that exposure of wildlife to snowmachine use can result in behavioral alteration, habitat avoidance, and increased energy expenditures. These changes could occur at critical times when animals are under extreme stress due to winter privations. Energy conservation during winter is crucial. As winter progresses, animals can experience an energy deficit, as more energy is used to survive than is replenished. The survival of individual animals depends on the severity of energy expenditures as well as the animal's energy stores.

Even in those studies that did not examine or demonstrate long-term abandonment, animals still showed an alteration in activity patterns and increase in movements that elevated energy expenditures (Eckstein et al., 1979; Richens and Lavigne, 1978). During public meetings on the 1999 temporary closure, some members of the public stated that they did not see animals move in response to snowmachine passage. It is possible that some animals may become habituated enough to snowmachine traffic to remain near a regular snowmachine use area. Research indicates that it is also possible that these animals still may be experiencing considerable stress in those situations (Moen et al., 1982). This study noted that there was no reduction in either the magnitude of the heart rate response or the time of return to a normal rhythm. Other studies have noted that what appears to be habituation could also be the decrease in animal response to a particular stimulus through time as a result of the progressive weakening of an animal's physical condition throughout the winter and/or the need to preserve critical winter energy stores (Richens and Lavigne, 1978).

Research indicates that additional stress from disturbance by increased human activity could have a detrimental effect on bears during this critical period of time (Goodrich and Berger 1994; Watts and Jonkel, 1989). Recreational activities may cause stress to bighorn sheep, which leads to increased heart rate and energy expenditure (MacArthur et al., 1982).

#### Stress Impacts on Denali Wildlife Values and Habitat

Under this alternative there would be many additional miles of snowmachine trails and increased snowmachine activity levels throughout all types of habitats. This area of previously protected

habitat is particularly vulnerable to increased disturbance given the easy access afforded by its close proximity to the George Parks Highway. This new pattern of use would leave little opportunity for wildlife avoidance and refuge. This major change in the level and extent of human activity in this historically undisturbed winter environment would represent a significant change from the long-standing patterns of non-intrusive human interaction with wildlife and could affect many individual animals over a large area. Consequently, the stress created by alterations in winter habitat use or energy expenditures would occur at a level of more than just a few individuals adjacent to a single trail.

Any increase in stress through added energy expenditure or loss of preferred habitat is a concern in the difficult times of winter. Generally, animals such as caribou and moose are in good condition during the winter, but this may vary significantly depending on environmental factors such as snow depth or crusts. During difficult winters when snowfall is deep, stress to wildlife that are already weak could be more pronounced due to contact with snowmachines. Snow conditions that are bad for wildlife may be good for travel by snowmachine. Snowmachine use is likely to occur at greater intensity and reach into more areas when there is good snow cover. Effects on individual animals would occur. The occurrence of any population-level effects would likely depend upon the severity of the winter as well as the level and spatial extent of snowmachine use. Adverse effects would most likely occur during mid to late winter when wildlife is more likely to be in a nutritionally-stressed condition. For example, bears, which are present and den in the Old Park, emerge from their dens in spring when snow cover often is still adequate for snowmobiling. Snowmachine use around bear dens while the bears are still in them also could increase stress levels in bears.

Many raptors, including gyrfalcons, golden eagles, northern goshawks, northern hawk owls, great horned owls and boreal owls, begin their nesting activities in early March in Denali when snow cover often is adequate for snowmobiling. If additional stress caused by human disturbance occurred during this critical portion of the nesting cycle, it would disturb nesting raptors and could cause nest abandonment.

If changes in birth rate and survival of young and mortality of older animals occurred, it could, in turn, cause changes in predator/prey relationships. These changes would compromise the value of the Old Park as a site for comparative studies. Also, any changes related to increase stress would be difficult to distinguish from the effects of natural stress. The introduction of yet another variable could further complicate the research that is being conducted in the Old Park areas because it would be difficult to determine what changes are related to natural process or human activities. Currently, human activity in the Old Park is negligible and confined to a limited corridor of use. This alternative would change that situation and possibly alter the ability to use the Old Park as a control site for important scientific studies.

#### General Impacts on Wildlife Distribution and Behavior

Wolves: A recent report (Olliff et al., 1999) makes the following statement regarding impacts on wolves:

Some information exists on specific effects of winter recreation on gray wolves. Most information, however, is available from data on the effects of other human activities. Paquet et al. (In Press) found that winter movements of wolves in Canadian parks were influenced by human activities. Winter activities that compact snow cover, such as snowmobiling, cross-country skiing, and maintenance of winter roads, provided feasible routes for wolves into areas that were usually inaccessible because of deep snow (more than 15.5-19.5 inches). The consequences of this are that there may be modifications to wolf/prey interactions and habitat use as well as differences in landscape movements between groups of prey (Paquet et al., In Press).

A 4-year study in Voyageurs National Park, Minnesota found that snowmachines were adversely affecting wolves through displacement and disturbance (Voyageurs National Park, 1996):

It is reasonable to assume a disturbance threshold exists where repeated avoidance by or displacement of an animal may result in: (1) more permanent displacement of the wolf or wolves; (2) impacting an individual animal's winter energy budget as to adversely affect productivity or survival; or (3) conditioning the animal to avoid certain areas.

Information in this report does not prove harm to wolves, but the fact that wolves consistently avoided snowmachines indicates it is prudent for NPS to close important wolf foraging areas to winter use until a better understanding of wolf/snowmachine interactions can be determined.

Deer: A significant negative correlation between the number of deer seen along a 10-kilometer trail and low intensity snowmachine use was observed in Minnesota (Dorrance et al., 1975). Dorrance (1975) suggests that deer home ranges may increase in the presence of snowmachines. Other studies observed changes, but the movements away from preferred habitat were only temporary (Eckstein et al., 1979; Richens and Lavigne, 1978).

Moose: Surveys and research show that animals at Denali National Park and Preserve seek specific habitats in winter to help them survive. Moose, for example, seek out certain types of willow stands. The inability to use these important areas could have serious consequences at this stressful time of the year. Observations by Alaska Department of Fish and Game biologists in the Talkeetna Mountains near Denali National Park and Preserve indicate that increasing recreational snowmachine use is beginning to alter moose use of preferred treeline willow habitats (pers. comm., Herman Griesse, ADF&G). In another area, one of the benefits cited for the shortening of a winter hunt near Lake Clark was that there would be less stress to cow moose in gestation from hunters on snowmachines searching for bull moose through a longer winter season (USFWS, 1999).

Dall Sheep: Several sources cite the loss of habitat and the use of traditional migration routes as concerns associated with bighorn sheep (Constan, 1975; Horejsi, 1976; Reisenhoover et al., 1988; EPFW, 1993). Various recreational activities are known to cause displacement from

preferred habitats (Horejsi, 1976; Hicks and Elder, 1979) and fleeing when approached by people (MacArthur et al., 1982). Similar reactions by Dall sheep would be expected when confronted with other forms of human activity such as the presence of snowmachines.

**Bears:** A study that examined the disturbance to grizzly bears by seismic survey activities (operation of aircraft, track-mounted drill rigs, geo-phone vehicles, Bombardiers, and snow mobiles) while bears were denning (Reynolds et al., 1984). The report concluded that only minimal disturbance occurred, however, none of the activities took place immediately at den sites. A study of winter recreation and its effects on hibernating black bears (Goodrich and Berger, 1994) showed that some bears abandoned dens and cubs in response to disturbance and all but one bear remained active after abandonment. Knight (1976) documented an incident where snowmachines may have disrupted a denning grizzly bear causing the bear to relocate to a second den site. Areas that previously were inaccessible to snowmachines, including areas used by grizzly bears for denning, would become more accessible in the future as improvements in snowmachine technology allow machines to travel further and faster than was possible in the past. Any impacts that are occurring to denning bears would likely increase in the future because of this.

**Wolverine:** Denning wolverines appear sensitive to human disturbance in the denning area. Copeland (1996) believes that technological advances in over-snow vehicles and increased interest in winter recreation has likely displaced wolverines from potential denning habitat and will continue to threaten a possibly limited resource. In the Lolo National Forest, Montana, female wolverines in the area are presumed to have abandoned any potential denning areas that experience snowmachine use (USFS, 1998). In an Idaho study (Copeland, 1996), snowshoers caused den abandonment in a cirque basin. Snowmachine use would likely cause den abandonment and probably have a larger disturbance zone because of greater noise, speed and range of movement. Technological advances could also increase the potential for impact to this species in the future.

**Lynx:** The U.S. Fish and Wildlife Service stated in a proposed rule (63 FR 36993-37013) to list the lynx in the Contiguous United States as a Threatened Species that:

Elevated levels of human access into forests are a significant threat to Canada lynx because they increase the likelihood of lynx encountering people, which may result in displacement of lynx from their habitats and/or possible injuries or deaths by intentional or unintentional shooting, trapping, and vehicle accidents (Hatler, 1988; Thiel, 1987; Brittell et. al., 1989; Koehler and Brittell, 1990; Brocke et. al., 1991; Andrew, 1992; Washington Department of Wildlife 1993; Brocke et. al., 1993; M. Hunter, University of Maine, pers. comm., 1994). Human access into Canada lynx habitat in many areas has increased over the last several decades because of increasing human populations and increased construction of roads and trails and the growing popularity of snowmachines and offroad vehicles. In the interior Columbia River basin of Washington, Oregon, Idaho, and Montana, increased human access has decreased the availability of areas with low



human activities, which are important to large forest carnivores, including lynx (U.S. Forest Service and Bureau of Land Management, 1997).

Competition during late winter, a time when lynx are already nutritionally stressed, may be especially detrimental to lynx (Koehler and Aubry, 1994). Snowmachine trails and roads that are maintained for winter recreation and forest management activities enable coyotes and bobcats to access lynx winter habitat (Koehler and Aubry, 1994). Snowmachine use in the Great Lakes and Rocky Mountain/Cascades regions has resulted in an increase in both human presence and the prevalence of packed snow corridors in lynx habitat. The increased snowmachine use and the increased area in which snowmachines are used likely diminishes habitat quality for lynx, and also decreases the lynx's competitive advantage in deep snow. This results in an increased threat posed by competitors, as a result of the increase in hard-packed snow trails.

(Note: Lynx populations are considered to be natural and healthy within the Old Park at this time.)

Characteristics of snowmobiling including dispersal over the landscape, operation at night when lynx are active, alteration of the mobility and distribution of snowshoe hares, and winter operations all point to the activity as being potentially adverse to lynx (Olliff et al., 1999).

Snowshoe Hares and Red Fox: Snowshoe hare (an important prey species for lynx and predatory birds) and red fox mobility have been shown to be affected by snowmachine use (Schmid, 1983). Rongstad (1980) reported that cottontail rabbit home range size increased significantly when snowmachines were present. Also, Numann and Merriam (1972) found snowshoe hares reducing their use of habitat near snowmachine trails.

Ptarmigan: There is evidence of changes in distribution and habitat use from snowmachine use on these species (Braun, 1971). Local subsistence users have observed similar effects on ptarmigan populations adjacent to the Park from the increasing levels of recreational snowmachine use in that area. (Denali Subsistence Committee, Meeting Notes April 26, 1996, and June 28, 1993).

Small Mammals: Small mammals inhabiting the subnivean environment are adversely affected by snowmachine use. Jarvinen and Schmid (1971) noted increased small mammal mortality beneath compacted snow. They concluded:

Mortality of subnivean mammals in the area packed by snowmachines was probably due to a combination of factors that increased winter stress to the point where survival was improbable. Mechanical compaction of snowfields will (1) destroy subnivean air spaces, (2) reduce snow depth, and (3) increase density, thermal conductivity, thermal diffusivity and shear strength of snow. These effects would in turn be inhibitory to mammal movement beneath the snow and at the same time subject subnivean organisms to greater

temperature stress. There is also the possibility that air beneath packed snow may become toxic because of abnormal carbon dioxide accumulation.

Members of the public observed that the numerous snowmachine trails frequently seen across open meadows create subsurface fences or barriers in the snow that could affect subnivean animals on a larger scale than just a single trail (Kathy Ernst, Talkeetna Public Meeting, November 24, 1998).

Just as in other areas where snowmachine use has been studied, there is a close connection in the Old Park between predators and this small mammal prey base. If changes in the prey base were to occur, it could also alter predator populations.

Some studies indicate that in certain situations an individual skier can cause a greater wildlife response than a single snowmachine due to the lack of warning noise provided by the skier (Aune, 1981; Cassirer et al., 1992; Eckstein et al., 1979; Freddy et al., 1986). However, some of these studies were conducted on trail systems or in areas where animals were more familiar with snowmachines and other motorized equipment than with people on foot or skis. Observations in other locations where all types of use were equally unfamiliar to animals or not restricted to trails, such as the Denali situation, demonstrate equal or greater responses to snowmachines (Aune, 1981). Information on relative impacts also must be considered in the context of the frequency of encounters and the distance at which the animal is likely to be first disturbed. The much larger total area traversed by a snowmachine per unit of time increases the relative effects of snowmachine use in an area when compared with nonmotorized users (Brader, 1974).

Compacted trails also change distribution patterns of animals by providing energy efficient travelways that alter winter survival rates, predation rates, distribution patterns, availability of carrion for use by other species, and levels of human conflict (Meager et al., 1994). Compaction of snow in forage areas can also have other negative effects on wildlife foraging. It increases energy expenditure by ungulates such as caribou that must dig for vegetation in extremely stressful winter months (Fancy and White, 1995).

Research at Denali also indicates that snow depth and winter travel conditions are important factors in winter survival for ungulates and the predators that depend upon them (Adams and Dale, 1998). Public testimony and staff observations indicate that many animals such as moose, caribou, wolves, and other canids all use compacted trails when they are made available to reduce travel-related energy expenditures.

#### *Impacts to Denali Wildlife Distribution and Behavior*

Snowmachines have only recently been able to access high elevation areas. Anticipated levels of snowmachine use represent a greater potential to change wildlife distribution than the current low-level use by non-motorized recreationists.

This alternative would result in the addition of many miles of snowmachine trails and increased snowmachine activity levels throughout all types of habitats. This area of previously protected

habitat is particularly vulnerable to increased disturbance given its close proximity to the George Parks Highway. This new pattern of use would be a major change in the level and extent of human activity in this historically undisturbed winter environment, and would leave little opportunity for wildlife avoidance and refuge. It also would represent a significant change from the long-standing patterns of non-intrusive human interaction with wildlife. Consequently, many species likely would be affected by the presence of extensive trail systems and increased encounter rates resulting from anticipated widespread new levels of snowmachine use in the Old Park.

Encounters and effects on wolves, moose, Dall sheep, bears, wolverine, hares, red fox, ptarmigan, and small mammals would be expected throughout the entire Old Park area where snowmobiling would occur. Impacts to moose, hares and red fox would likely be more pronounced along river drainages used as travel corridors by snowmachiners because these animals tend to congregate in these areas. Effects would include stress, displacement and temporary abandonment of preferred habitat. Anticipated cross-country snowmobiling across open terrain above tree line would interact with animals such as wolves or wolverines that range widely across such areas. Hill climbing or high marking would place snowmachine use in alpine areas near sheep and ptarmigan. Impacts on lynx would be limited due to their use of tall shrub and forested habitat which covers only about one third of the Old Park area and may be less desirable for snowmobiling. Populations of all the species mentioned are currently at natural and healthy levels. Caribou numbers are at low levels, but the population is still considered to be in good physical condition during most winters.

The most immediate and direct effects would be at the level of changes in the habits of individual animals. These impacts would be distributed over a large area and many individuals due to the likelihood of a widespread pattern of crosscountry use. Population-level effects are possible. This is especially true during severe winters when wildlife is already experiencing a high level of natural stress or limitations on movements. Local factors increase the risk that a detrimental effect would occur before sufficient corrective actions could be taken.

Any incremental disruptions of natural processes would compromise the long-standing value of this area as a comparative site for scientific studies and as a premier wildlife viewing experience for hundreds of thousands of visitors. Snowmachine use introduces yet another variable into the already complex studies of predator and prey relationships.

#### Cumulative Effects

The summer disturbance to wildlife is currently confined to the narrow corridor of the park road. The disturbance from backcountry users is not expected to change in the future due to the permitting system in place at the park resulting in stable use levels over the last 20 years. The levels of disturbance to wildlife in and near the Old Park during summer, when forage is more available for most animals, do not contribute to the severity of impacts from disturbance during the winter when survival is difficult. This would not be expected to change in the future, given the legal limits on motorized and non-motorized activities in the park during the summer.

Some wolves, bears, moose, caribou, and other animals, which spend most of their time inside the park, have large home ranges and are trapped or hunted outside the park. Most of the prey base animals found in the Old Park, such as hares, squirrels, ptarmigan, and small rodents, would not move outside the Old Park boundaries. Population effects in the Old Park have not been observed for the species that are hunted or trapped outside the park.

The wintertime disturbance to wildlife in and near Denali National Park is predominantly from snowmachine use. People on foot or using dog teams cannot effectively pursue animals across untracked snow because of the slowness of trail breaking, nor do they create the extensive trail networks that are typical in areas regularly used by snowmachines. High performance snowmachines can cross almost any snow-covered terrain faster than wildlife and cover many miles in a day in many types of terrain and snow conditions. Under this alternative, which would allow unrestricted snowmachine use, the most significant new disturbance to wildlife in the Old Park would be from snowmachine use.

The cumulative effects of increased unrestricted snowmachine use in addition to non-motorized access into wild places would result in almost no undisturbed winter habitat for some wildlife species.

#### Cultural Resources

Winter access to the Old Park via snowmachines likely would result in greater numbers of people using the Old Park, which could increase the risk of vandalism to 13 cabins on the National Register of Historic Places, others eligible for nomination, and other structures that have incomplete documentation. Archeological sites could be exposed to increased disturbance through snowmachine use. Many of these sites are found on exposed ridges that are more likely to blow free of snow and to be exposed to mechanical damage from snowmachine tracks.

#### Cumulative Effects

Access to the cultural resources of the Old Park, including summer access by backpackers, has resulted in minimal disturbance to these resources. Future disturbance to the Old Park's cultural resources (i.e., historic cabins) likely would be due to increased snowmachine use in the Old Park. The ease of access into the Old Park by snowmachines would contribute to the potential for impacts to cultural resources.

#### Recreation, Visitor Use, and Wilderness Values

Impacts to wilderness values, recreation and visitor use are summarized in Table 3-4.

**Table 3-4 Summary of Recreation, Visitor Use and Wilderness Values Impact Causes and Effects**

<b>Impact Cause</b>	<b>Effect on Recreation, Visitor Use, and Wilderness Values</b>
Snowmachine use in remote areas	<ul style="list-style-type: none"> <li>• Natural quiet, solitude, and undisturbed vistas would be diminished.</li> <li>• One of the only areas in Alaska where winter recreation use has been managed for non-motorized activities would be</li> </ul>

	<p>lost.</p> <ul style="list-style-type: none"> <li>• Snow compaction with subsequent vegetation changes would make some winter trails visible in the summer.</li> </ul>
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**Table 3-4 Summary of Recreation, Visitor Use and Wilderness Values Impact Causes and Effects (cont.)**

<b>Impact Cause</b>	<b>Effect on Recreation, Visitor Use, and Wilderness Values</b>
Snowmachine use in recreation areas used by non-motorized recreationists	<ul style="list-style-type: none"> <li>Widespread user conflicts would arise between snowmachine users and other recreationists, such as cross-country skiers, skijors, and dog mushers.</li> </ul>
Motorized use in designated wilderness	<ul style="list-style-type: none"> <li>Wilderness values would be significantly reduced.</li> </ul>

*General Impact to Recreation, Visitor Use and Wilderness Values*

A study in Canada found that non-motorized users, such as cross-country skiers, were negatively impacted by the presence of snowmachines, whereas snowmachinists tended to be more indifferent to non-motorized users (Jackson and Wong, 1982). This is consistent with public comment received at Denali that indicates that conflicts cannot be resolved unless there is an area where snowmachine use is completely excluded. Relying on multiple use areas as a management tool is not an effective solution because this does not adequately protect the resource values, such as natural quiet and solitude, that are a critical component of many visitors' abilities to enjoy the area. The study also found that cross-country skiers prefer self-propelled, low-impact activities that reflect their desire for solitude, tranquillity, and a relatively undisturbed natural environment. Snowmachine users preferred machine-oriented activities, which provided an outlet for adventurousness and sociability.

In visitor use surveys in Yellowstone and Grand Teton National Parks (Littlejohn, 1996 & 1996a), many respondents reported that noise, pollution, and impacts to wildlife from snowmachine use were the least enjoyable part of the national park experience.

A study in the Sawtooth National Recreation Area (USFS, 1998) found that snowmachine engine noise would likely interrupt the feeling of solitude. Along snowmachine travel routes, noise is most intense as snowmachines approach and pass; sound should decrease within approximately one mile on either side of the pass (USFS, 1998). People could hear snowmachines up to two miles away, with the noise easier to hear along ridges in that forested area. Sounds would travel farther above treeline and during colder weather, such as would be the case for most of the use in the Old Park. One report tells of skiers in the Old Park hearing a bulldozer 30 miles away outside the park during late winter (NPS, 1977 unpublished). Park staff observations also indicate snowmachine noise can be heard at least five miles away under winter conditions.

*Denali Specific Recreation, Visitor Use and Wilderness Values Impacts*

The lack of a definition of traditional activity within the context of Section 1110(a) of ANILCA would make it difficult, if not impossible, to separate out those uses of snowmachines which are not for traditional activities. All use of snowmachines, within the limits of safe operation (36 CFR 2.18), likely would be presumed to be legal. Snowmachine use within the Old Park would adversely affect the park management goals of preserving the non-motorized, off-road experience and retaining the historical level of resource protection. Opportunities for non-motorized wilderness recreation in Denali National Park and Preserve, would be curtailed or

eliminated if rising snowmachine use levels and expansion of use into the Old Park are not controlled. These opportunities are dependent on wilderness values, such as solitude, natural sound, surroundings where the imprint of man's work is substantially unnoticed, as well as on a setting where there is an opportunity for a primitive type of recreation. Few areas with these qualities are readily available or adjacent to the road system of Alaska.

User conflicts exist between snowmachine recreationists and such non-motorized recreationists as cross-country skiers, skijorers, and dog mushers (public comment and written correspondence, 1998). These conflicts are created by the detrimental effects snowmachines have on the resource values essential for the continued enjoyment of the area by non-motorized users, principally loss of solitude and ability to hear the sounds of nature due to the presence, noise, and exhaust generated by snowmachines. This alternative would not provide adequate protection for those values. The number of people experiencing conflict of use in Denali at present is low because snowmachine use has never occurred in large numbers in the area. However, public comment indicated that some former non-motorized users of the south side of the Alaska Range were not returning because of the increased snowmachine use (public comment and written correspondence, 1998). These conflicts and abandonment would increase throughout the Old Park if snowmachine use were to expand into areas not presently experiencing this type of use. Visitor expectations of a visit to the Old Park within the mandates that apply to a designated wilderness area would be severely diminished by the use of snowmachines in the area.

Many of Denali's visitors come to the park with high expectations of being in a non-polluted area. Public testimony leading up to the 1999 temporary closure specifically mentioned that the sight and smell of snowmachine exhaust limited the ability to enjoy the park. (Denali public comments, 1998). Any diminishment of air quality or water quality, even if measurements are below the standard level of pollution, would likely be perceived as extreme to those visitors.

Snowmachine use in the winter can negatively affect visitor aesthetics in the summer months. Changes that relate to snow compaction can combine to make some winter trails visible in the summer. The visible evidence left in the summer from vegetation and soil changes created by winter use trails would mar wilderness landscape vistas for visitors to Denali.

#### Cumulative Effects

Snowmachine use likely would continue to expand into other remote areas of Alaska due to population and technology growth. This would result in increasing loss of opportunities for quiet recreation in other areas, and the value of areas available for these pursuits, including the Old Park, would increase.

Motorized and non-motorized recreation during winter would adversely affect recreation, visitor use, and wilderness values in the Old Park. Because of the limits on the use of vehicles in the Old Park in the summer, and the limited use of airplanes in the Old Park in the winter, almost all of the potential future winter impacts to wilderness resources/values from vehicles in the backcountry in the Old Park would be from snowmachine use. Conflicts are created by the detrimental effects snowmachines have on the resource values that are essential for enjoyment of

the area by non-motorized users. Snowmachine use would be the single most important impact to values such as solitude and natural quiet in the Old Park during the winter.

### Subsistence

Increased snowmachine traffic to the Old Park, originating mostly in Broad Pass, would diminish subsistence opportunities for small game and trapping in the park additions, by causing displacement of game and tangling or destruction of trap lines. These types of impacts already have been observed in the area adjacent to the Old Park (Denali Subsistence Commission Meeting Minutes, August 9, 1996). The extent of the impacts would depend on the extent of the increased traffic (see Appendix A).

### Cumulative Effects

Increased snowmachine and ATV traffic outside the park additions could generate more reliance on federal areas, such as the park additions, for subsistence opportunities. (see also Appendix A).

### Park Management

Short- and long-term studies would need to be initiated to evaluate the impacts to park resources from increasing snowmachine use. Topics covered by such studies would include those concerning snowmachine impacts to air and water quality, vegetation, wildlife, subsistence use, wilderness resources, and conflicts with other winter recreationists. There is also a lack of important information on ecosystem level effects. This lack of information further increases the risk of detrimental impacts on resource values. Snowmachine impact studies have generally been conducted on a very small spatial scale and for only short time periods. This review of scientific data found no studies that evaluate the long-term impact of widespread, cross-country travel and multiple trail travel that commonly occurs in Alaska. Even large impact evaluations such as the one from a Montana evaluation (Montana FWP, 1993) and a large review commissioned by snowmachine clubs in Canada (OFSC, 1994) have focused primarily on designated trail systems. These assessments assume mitigation of impacts is possible because the impacts of trails and activity related to the trail can be controlled by routing and because these impacts also will have only limited spatial implications. However, there is no evidence to support this assumption of mitigation in situations where extensive cross-country travel can create disturbances throughout virtually all habitat areas. This lack of long-term ecosystem based studies is a major concern because of Denali's value as a natural system and a benchmark for long-term studies of international importance. To accomplish these studies either internally or through contract, increased park funding would be required.

A significant public information and education effort would be required to inform snowmachine users about safe travel practices and NPS regulations regarding snowmachine use and wildlife protection. To accomplish this effort would require increased park funding.

Enforcement of the regulations (36 CFR 2.18) to promote safe operation of snowmachines in an NPS unit would require staffing above existing levels.



The lack of a definition of traditional activity within the context of Section 1110(a) of ANILCA would make it difficult, if not impossible, to separate out those uses of snowmachines which are not for traditional activities. All use of snowmachines, within the limits of safe operation (36 CFR 2.18), likely would be presumed legal. This use within the Old Park would adversely affect the park management goals of preserving the non-motorized off-road experience and retaining the historical level of resource protection.

### Cumulative Effects

The majority of wintertime management activity in the future would be focused on snowmachine management and snowmachiner education. The ranger staff at Denali presently patrols routes known to be used by dog mushers, skiers, and other non-motorized users. The anticipated use by snowmachiners would require additional patrols, and the majority of these patrols would be in the Old Park. Patrols would take place over larger areas because of the mobility afforded by snowmachines, and the patrols would often have to be made on snowmachines, further impacting the Old Park's wilderness values. Additional public outreach would be required from the park staff, in cooperation with snowmachine user groups.

### **Alternative 2: Partial Closure of the Old Park to Snowmachine Use**

The area left open to snowmachine use under this alternative (Figure 4) has experienced virtually all of the past snowmachine use in the Old Park in recent years. Snowmachine use would continue to increase in the open area, and the absence of a definition of traditional activity would make it very difficult to limit it to specific uses.

The impacts of this alternative are similar to the No Action Alternative for the approximately 180,000 acres of the Old Park proposed to be open to snowmachine use. General impacts are described in more detail for the No Action Alternative. The impacts specific to the Old Park are presented below.

### Air and Water Quality

Localized, short-term concentrations of carbon monoxide and other air pollutants would occur in areas where snowmachines were used. Snowmachine use would diminish the air quality in the 180,000 acre area. This diminishment to air quality likely would be below the federal standards for pollution. However, those standards do not consider that most backcountry areas of Denali have had little exposure to pollution. Impacts to air and water would be greatest under this alternative because any future use would be concentrated in this portion of the Old Park.

Unburned hydrocarbons would accumulate on the snow surface and eventually wash into streams and lakes, causing localized degradation of the high water quality of the Old Park. This diminishment to water quality appears to be below the federal standards for pollution. This cannot be established with certainty until further research is conducted. Also, those standards do not consider that most backcountry areas of Denali have had little exposure to pollution. Those standards do not take into account that many of Denali's visitors come to the park with high

expectations of being in a non-polluted area. Any diminishment of water quality, even if measurements are below the standard level of pollution, becomes extreme to those visitors. This diminishment would be contrary to the air quality non-degradation policy in parks.

Even minor impacts to water and air quality from non-point source pollution would have impacts on the current importance of the Old Park as a significant site for long term monitoring. For example, a long term water quality monitoring site was just recently placed in the Dunkle Hills area that is intended to be a experimental control site for the Susitna River Basin.

### Cumulative Effects

Pollution from snowmachine traffic is in addition to the pollution contributed by busses, administrative traffic, and transport of industrial pollutants from Eurasia. In winter, snowmachines likely would be the largest contributor to air quality impact in the park. This is especially true in the 180,000-acre area, which is currently less affected than the north side of the Alaska Range by these other sources of pollution. No other water pollution sources besides snowmachines have been identified for the Old Park. The ability to use Denali as a long-term reference site for pollution studies would be compromised by the addition of pollutants from snowmobiling in the 180,000 acres of the Old Park that would be open to snowmachine use.

### Vegetation, Soils, and Wetlands

Given the extensive area under consideration in this alternative, it is difficult to determine the amount of snow cover that is needed to prevent damage to vegetation and soils. Staff observations of snow pack conditions in this area in 1999 indicate that adequate snow cover to protect vegetation does not occur uniformly over the area. This is due to variation in terrain, snow depth, and snow pack characteristics such as crusts, snow density, or layers within the snowpack. Therefore, if any level of use is allowed within the 180,000-acre area, damage to vegetation is likely at some locations. Park staff have observed damage to vegetation from the low levels of use in the area during the past few years.

Having enough snow to barely cover vegetation may not be adequate to protect vegetation. Staff observations of the snow conditions at Denali indicate that snowmachine tracks may sink down well into snowpack depending on the characteristics of the snowpack. Consequently, vegetation that may appear to be protected is actually susceptible to abrasion.

Impacts likely would be more severe in this 180,000-acre area than at the other locations referenced in the literature. Field observations in this area show that the snowpack lasts longer and is more compacted and dense in snowmachine trails. Trail formation would create artificial changes in soil temperatures and moisture content and vegetation species composition along frequently used routes. Where the snow depth is shallower, such as in wind-scoured snow free zones, it is likely that widespread damage to exposed soil, plants and lichens would occur.

Impacts to shrub communities likely would be less in this alternative due to greater snow depth in the area and the fact that three quarters of the Old Park is at or above shrubline. Only

additional research could determine that the likely impacts to the alpine vegetation in this area would be any different than in other portions of the Old Park.

Use across open areas such as meadows, lakes, or open slopes, is not typically confined to single narrow corridors. Staff observations indicate that snowmachine use often occurs in the form of multiple parallel trails, in some cases as much as 100 meters wide and extending for over 2 miles. The expansiveness of these trail corridors multiplies the potential impacts of snowmachine use on vegetation and soils.

Impacts from snowmachine use to the sensitive vegetation and permafrost soils of the subarctic found in the 180,000 acre area of the Old Park would increase the creation of permanent trails, soil erosion, damage or loss of vegetation, and the delay or permanent prevention of recovery once the impact to soils and vegetation has occurred.

#### Cumulative Effects

The vegetation, soils, and wetlands of the Old Park are subject to air and water pollution from motorized vehicles within the park. Vegetation impacts from off-road hiking is at equilibrium due to limits which have stabilized use for the past twenty years. Negligible impacts would occur in the 180,000-acre area due to these activities. Most damage to vegetation, soils, and wetlands would be from snowmachine use. No mechanized vehicles in the backcountry of the Old Park other than snowmachines come in direct contact with the vegetation and soils. Snowmachine use in 180,000 acres of the Old Park would represent a widespread new source of impacts to vegetation from human use. If trails through vegetation, such as willows, were created through winter snowmachine use, those trails could be selected for use by summer hikers, creating more use and damage along trail corridors.

#### Wildlife Values and Habitat

Harassment of wildlife, both purposeful and unintended, would be unavoidable under this alternative. The large area that would be open to travel would make the prevention of intentional harassment through patrols essentially impossible. The cross-country nature of snowmachine travel and the rates of speed that likely would occur would make unintended harassment events inevitable.

#### Stress Impacts on Denali Wildlife Values and Habitat

Under this alternative there would be many additional miles of snowmachine trails and increased snowmachine activity levels throughout all types of habitats. This area of previously protected habitat is particularly vulnerable to increased disturbance, given the easy access afforded by its close proximity to the George Parks Highway. This new pattern and anticipated increasing level of use would represent a significant change from the long-standing patterns of non-intrusive human interaction with wildlife, and would adversely affect many animals over the 180,000 acre area. Consequently, the stress created by any alterations in winter habitat use or energy expenditures would occur at a level of more than just a few individuals adjacent to a single trail.

Any increase in stress through added energy expenditure or loss of preferred habitat is a concern in the difficult times of winter. Generally, animals such as caribou and moose are in good condition during the winter, but this may vary significantly depending on conditions such as snow depth or crusts. During difficult winters when snowfall is deep, stress to wildlife that are already weak could be more pronounced due to disturbance from snowmachines. Snow conditions that are bad for wildlife may be good for travel by snowmachine. Snowmachine use is likely to occur at higher levels and reach into more areas when there is good snow cover. Effects on individual animals would occur. The occurrence of any population level effects would likely depend upon the severity of the winter and the level and spatial extent of snowmachine use. Adverse effects would be most likely to occur during mid-to-late winter when wildlife is most likely to be in a nutritionally-stressed condition. For example, bears, which are present and den in this 180,000-acre area of the Old Park, emerge from their dens in spring when snow cover often is still adequate for snowmobiling. Snowmachine use around bear dens while the bears are still in them also could increase stress levels in bears.

Many raptors, including gyrfalcons, golden eagles, northern goshawks, northern hawk owls, great horned owls and boreal owls, begin their nesting activities in early March in Denali when snow cover often is adequate for snowmobiling. If additional stress caused by human disturbance occurred during this critical portion of the nesting cycle, it would disturb nesting raptors and could cause nest abandonment. Nesting areas for the forest dwelling species is limited in this 180,000-acre area so the impact would be reduced accordingly.

If changes in birth rate and survival of young and mortality of older animals occurred, it could, in turn, cause changes in predator/prey relationships. This would compromise the value of this 180,000-acre area of the Old Park as a site for comparative studies. Also, any changes related to increased stress would be difficult to distinguish from the effects of natural stress. The introduction of yet another variable could further complicate the research that is being conducted in this area because it would be difficult to determine what changes are related to natural process or human activities. Currently, human activity and the resultant impacts in the this area is negligible. This alternative would change that situation and possibly alter the ability to use this portion of the Old Park as a control site for important scientific studies.

#### *Impacts to Denali Wildlife Distribution and Behavior*

Snowmachines have only recently been able to access high elevation areas. Anticipated levels of snowmachine use represent a greater potential to change wildlife distribution than the current low-level use by non-motorized recreationists.

This alternative would result in the addition of many miles of snowmachine trails and increased snowmachine activity levels throughout all types of habitats in the area of the Old Park left open to snowmachine use. This area of previously protected habitat is particularly vulnerable to increased disturbance given its close proximity to the George Parks Highway. This new pattern of use would be a major change in the level and extent of human activity in this historically undisturbed winter environment, and would leave little opportunity for wildlife avoidance and refuge. It also would represent a significant change from the long-standing patterns of non-

intrusive human interaction with wildlife. Consequently, it is likely that many would be effected by the presence of extensive trail systems and increased encounter rates resulting from anticipated widespread new levels of snowmachine use in the portion of the Old Park left open to snowmachine use.

Encounters and effects on wolves, bears, wolverine, hares, red fox, ptarmigan, and small mammals would be expected to occur throughout the entire area. Impacts to moose, hares, and red fox are likely to be more pronounced along river drainages that will be used as travel corridors by snowmachinists. Extensive cross country travel across open terrain above tree line would interact with animals such as wolves or wolverines that range widely across the area. Hill climbing or high marking would place snowmachine use in alpine areas near ptarmigan and Dall sheep.

Impacts on lynx would be less under this alternative than in Alternative 1 due to the lack of extensive habitat in this 180,000 acre area. Caribou and Dall sheep also do not have a major presence in this area during winter months. Dall sheep, for example, are restricted to only the Windy Creek drainage at this time of year and the Denali caribou herd winters primarily on the north side of the Alaska Range.

The most immediate and direct effects would be at the level of changes in the habits of individual animals in this portion of the Old Park. These impacts would be distributed over a large area and may individuals due to the likelihood of a widespread pattern of crosscountry use. Population level effects are possible and this impact cannot be ruled out until there is further research. This concern is especially true during severe winters when wildlife is already experiencing a high level of natural stress or limitations on movements.

Incremental disruptions of natural processes, as described above, would compromise the long-standing value of this area as a comparative site for scientific studies and the wildlife viewing experience for hundreds of thousands of visitors. Snowmachine use introduces yet another variable into the already complex studies of predator and prey relationships.

#### Cumulative Effects

The wintertime disturbance on wildlife in and near Denali National Park and Preserve is predominately from snowmachine use. People on foot or using dog teams cannot effectively pursue animals across untracked snow because of the slowness of trail breaking nor do they create the extensive trail networks that are typical in areas regularly used by snowmachines. High performance snowmachines can cross almost any snow-covered terrain faster than wildlife and cover many miles in a day in many types of terrain and snow conditions.

Some wolves, bears, moose, caribou, and other animals, which spend most of their time inside the park, have large home ranges and are trapped or hunted outside the park. Most of the prey base animals found in the Old Park, such as hares, squirrels, ptarmigan, and small rodents, would not move outside the Old Park boundaries. Population effects in the Old Park have not been observed for the species that are hunted or trapped outside the park.

The levels of disturbance to wildlife in and near the Old Park during summer, when forage is more available for most animals, do not contribute to the severity of impacts from disturbance during the winter when survival is difficult. This would not be expected to change in the future, given the legal limits on motorized and non-motorized activities in the park and preserve.

The cumulative effects of increased motorized into wild places would result in almost no undisturbed winter habitat for some wildlife species.

#### Cultural Resources

Access to cultural resources, including summer access by backpackers, has resulted in minimal disturbance to the park's cultural resources. Most future disturbance to the cultural resources in the 180,000-acre area likely would be from snowmachines. Winter access to the 180,000 acres of the Old Park via snowmachines could increase the risk of vandalism to 2 cabins on the National Register of Historic Places and to other structures that have incomplete documentation. Some archeological sites found on ridges would be exposed to increased disturbance through snowmachine use. These areas are more likely to be exposed due to windblown conditions and could be damaged by abrasion from snowmachine tracks or skis.

#### Cumulative Effects

Other access to these cultural resources, including summer access by backpackers, has resulted in minimal disturbance to the park's cultural resources. No cumulative effects to the cultural resources of the Old Park have been identified.

#### Recreation, Visitor Use, and Wilderness Values

Opportunities for non-motorized wilderness recreation, which is dependent on wilderness values such as solitude and natural sound, would be curtailed or eliminated within the 180,000 acre area of Denali National Park and Preserve if rising snowmachine use levels and expansion of use into that area are not controlled. Few other areas with all these qualities are available on the south side of the Alaska Range.

Many of Denali's visitors come to the park with high expectations of being in a non-polluted area. Public testimony leading up to the 1999 temporary closure specifically mentioned that the sight and smell of snowmachine exhaust limited the ability to enjoy the park. (Denali public comments, 1998). Any diminishment of air quality or water quality, even if measurements are below the standard level of pollution, would be perceived as extreme to those visitors.

User conflicts exist between snowmachine recreationists and such non-motorized recreationists as cross-country skiers, skijors, and dog mushers (public comment and written correspondence, 1998). These conflicts are created by the detrimental effects snowmachines have on the resource values that are essential for enjoyment of the area by non motorized users, principally due to loss of solitude and primitive and unconfined recreation from the presence, noise, and exhaust generated by snowmachines. This alternative would not provide adequate protection for those values.

The number of people experiencing conflict of use in this portion of Denali at present is low, although public comment indicated that some former non-motorized users of the south side of the range were not returning because of the increased snowmachine use (Public comment and written correspondence, 1998). These conflicts would increase throughout the area if snowmachine use were to expand into times of winter and parts of this area not presently experiencing this type of use. Visitor expectations of a wilderness visit to this area of the Old Park would be severely diminished by the use of snowmachines in the area.

Snowmachine use in the winter can negatively affect visitor aesthetics in the summer months. Changes that relate to snow compaction can combine to make some winter trails visible in the summer. The visible evidence left in the summer from vegetation and soil changes created by winter use trails would mar wilderness landscape vistas for late spring visitors to Denali.

The 180,000-acre area that would remain open under this alternative would provide an additional opportunity for snowmachiners to recreate in mountain terrain near a major highway. Loss of the opportunity to operate a snowmachine within approximately 1.8 million acres of the old portion of the park would have a negative impact on the group of recreationists who desire that experience. However, since almost all of Alaska adjacent to major road corridor is open to snowmachine use, this loss of a recreational opportunity is not considered significant relative to the loss of opportunity that would be experienced by nonmotorized users under this alternative.

#### Cumulative Effects

Summer activities or activities outside the park likely would not affect recreation in the 180,000-acre area of the Old Park during winter. Snowmachine use likely would continue to expand into other remote areas of Alaska due to population and technology growth. This would result in increasing loss of opportunities for quiet recreation in other areas, and the value of areas available for these pursuits, including the Old Park, would increase.

Snowmachine use would be the major cause of impact to park values, such as solitude and natural quiet, in the 180,000-acre area of the Old Park.

#### Subsistence Use

Increased snowmachine traffic to the Old Park, originating mostly in Broad Pass, would diminish subsistence opportunities for small game and trapping in the park additions, by causing displacement of game and tangling or destruction of trap lines. The extent of the impacts would depend on the extent of the increased traffic (see Appendix A).

#### Cumulative Effects

Increased snowmachine and ATV traffic outside the park additions could generate more reliance on federal areas, such as the park additions, for subsistence opportunities. (see also Appendix A).

#### Park Management

Short- and long-term studies would need to be initiated to evaluate the impacts to park resources from increasing snowmachine use. Topics covered by such studies would include those concerning snowmachine impacts to air and water quality, vegetation, wildlife, subsistence use, wilderness resources, and conflicts with other winter recreationists. To accomplish these studies either internally or through contract, increased park funding would be required.

A public information and education effort would be required to inform snowmachine users about safe travel practices and NPS regulations regarding snowmachine use and wildlife protection. To accomplish this effort would require increased park funding. Enforcement of the regulations (36 CFR 2.18) to promote safe operation of snowmachines in an NPS unit would require staffing above existing levels. An increase in expenditures for the enforcement of the snowmachine closure in the majority of the Old Park would be anticipated. This would primarily consist of aircraft overflights and patrols using snowmachines.

The lack of a definition of traditional activity within the context of Section 1110(a) of ANILCA would make it difficult, if not impossible, to separate out those uses of snowmachines which are not for traditional activities. All use of snowmachines, within the limits of safe operation (36 CFR 2.18), likely would be presumed legal in this 180,000-acre area. This use within the Old Park would adversely affect the park management goals of preserving the non-motorized off-road experience and retaining the historical level of resource protection.

#### Cumulative Effects

Wintertime management activity in the future would be focused on snowmachine management and snowmachiner education. The ranger staff at Denali presently patrols routes known to be used by dog mushers, skiers, and other non-motorized users. The anticipated use by snowmachiners would require additional patrols, and the majority of these patrols would be in the 180,000-acre area of the Old Park. Patrols would take place over larger areas because of the mobility afforded by snowmachines, and the patrols would often have to be made on snowmachines, further impacting the wilderness values of the 180,000-acre area of the Old Park. Additional public outreach would be required from the park staff, in cooperation with snowmachine user groups.

#### **Alternative 3: Temporary Closures of the Old Park to Snowmachine Use**

The impacts of this alternative would be the same as those discussed for Alternative 4; however, with respect to effects on park management, additional staff time and effort would be required to revisit and renew the temporary closure each year.

#### **Alternative 4: Permanent Closure of the Old Park to Snowmachine Use (Preferred Alternative)**

A permanent closure of the Old Park to snowmachine use, which assumes the proposed definition of traditional activity, generally would eliminate snowmachine use and associated impacts in the short term and over the long term. No mitigation measures are practical or necessary for the proposed action, since impacts from snowmobiling are removed from the Old



Park. Enforcement of the closure of snowmachine use within the Old Park could require staffing above existing levels, but not to the levels required by Alternatives 1 and 2.

#### Air and Water Quality

The use of Old Park as a national and international benchmark site for long-term monitoring would not be compromised because snowmachine use would not occur in the Old Park. Visitors would continue to experience air and water quality values that have not been diminished by the addition of a new source of pollution that is increasing in the area.

#### Cumulative Effects

Pollutants contributed by buses, administrative traffic, and transport of industrial pollutants from Eurasia would be the largest contributor to adverse air quality in the Old Park. No cumulative effects would be anticipated for water quality.

#### Vegetation, Soils, and Wetlands

Park visitors would not encounter additional signs of human activity beyond the levels that result from current non-motorized backcountry uses such as dog sledding. Signs of vegetation damage would not impair wilderness vistas. There would be no increase in the alteration of wildlife habitat.

#### Cumulative Effects

The vegetation, soils, and wetlands of the Old Park are subject to air and water pollution from motorized vehicles within the park. The impacts to vegetation from the summer use of vehicles in the park are limited to the road corridor and are largely unchanged in magnitude since the road was built 70 years ago. Vegetation growing on the park road fill slopes or backslopes tends to grow faster due to increased soil warmth and road runoff, although this impact is restricted to the road corridor. Vegetation impacts from off-road hiking is at equilibrium due to limits which have stabilized use for the past 20 years.

#### Wildlife Values and Habitat

This alternative would insure protection of internationally significant wildlife values and habitat. This alternative would prevent the incremental disruptions of natural processes that would ultimately compromise the long-standing value of the Old Park as a comparative site for scientific studies and the wildlife viewing experience for hundreds of thousands of visitors. It would prevent the introduction of yet another variable into the already complex studies of predator and prey relationships.

#### Cumulative Effects

Cumulative effects to wildlife and wildlife habitat would be from visitor and vehicle use along the park road in summer, from day-hiking and backpacker use in summer, and from non-motorized use by dog mushers and skiers in winter. The magnitude of these uses is currently is stable and limited, and the uses also are monitored and regulated so that the future effects from these uses are expected to be minimal, as past experience with these uses has indicated.

### Cultural Resources

There would be no impact to cultural resources under this alternative.

### Cumulative Effects

Access to the cultural resources of the Old Park, including access by backpackers in summer and access by non-motorized visitors in winter, has resulted in minimal disturbance to these resources. There is no reason to expect this would not remain the case, since these uses are stable and limited and would be expected to continue to be stable and limited.

### Recreation, Visitor Use, and Wilderness Values

Since this alternative would eliminate snowmachine use only in the Old Park, it would neither diminish nor alter access now enjoyed by snowmachine users on the remaining two-thirds of park and preserve land, an area of approximately four million acres. It would result in the loss of opportunity to operate a snowmachine in the Old Park and would be perceived as a negative consequence of the closure by those who desire that experience. However, since two-thirds of Denali National Park and Preserve and the vast majority of Alaska adjacent to road corridors is open to snowmachine use, this loss is not considered significant.

At the same time, this alternative would provide a benefit to those who desire an experience in the Old Park wherein mechanized sounds are virtually absent, consistent with the Wilderness Act. The Old Park would continue to provide a unique resource to those members of the public who seek solitude, natural quiet, and a non-motorized winter park experience because it is relatively accessible, compared to the rest of Alaska. It would remain one of the few areas currently available with these qualities that is readily available or adjacent to the road system of Alaska. The low density, non-motorized winter recreation that has developed in this area through the last 82 years of National Park Service management would continue.

### Cumulative Effects

The NPS has a permit system for the Old Park to ensure a high quality experience for visitors, whether in a concentrated situation, such as viewing wildlife and scenery from a bus along the park road, or in dispersed situations, such as hiking in the wilderness off the road. Establishing limits has retained a high-quality visitor experience. This alternative would preserve the high-quality wilderness values of the Old Park and the visitor uses that rely on these values.

### Subsistence Use

Subsistence is not permitted in the Old Park. There would be no significant impact to subsistence use under this alternative because there is currently only limited and recent snowmachine use within one edge of the Old Park. Therefore, a permanent closure would not redirect any significant level of snowmachine use toward adjacent lands where subsistence use is permitted. There is more likely to be a net benefit to subsistence users because increasing levels of snowmachine traffic enroute to the Old Park would not occur. This would ultimately reduce impacts on adjacent lands where subsistence activities are permitted. Further analysis is presented in Appendix A.

### Park Management

Enforcement of the closure of snowmachine use within the Old Park could require staffing above existing levels, but not to the levels required by alternatives one and two. Enforcement would consist primarily of aircraft overflights along with a continuation of ranger patrols by dog sled in the Old Park and snowmachine patrols in the new park additions. By reserving the Old Park for non-motorized visitor use, this alternative would contribute to the park's goal of ensuring a spectrum of visitor opportunities within Denali National Park and Preserve.

### Cumulative Effects

The majority of wintertime management activity in the future probably would be on snowmachine management in the new park additions and snowmachiner education, for which additional park funding and staffing would be needed. The anticipated use by snowmachiners in the new park additions would require additional patrols, and the majority of the patrols would be in the new park additions.

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## **APPENDIX A**

### **ANILCA SECTION 810(A) SUMMARY OF EVALUATIONS AND FINDINGS**

#### **I. Introduction**

This evaluation and finding was prepared to comply with Title VIII, Section 810 of the Alaska National Interest Lands Conservation Act (ANILCA). It evaluates the potential restrictions to subsistence activities which could result from the proposed permanent closure of the former Mount McKinley National Park area (also referred to as the Old Park ) of Denali National Park and Preserve to the use of snowmachines and from alternatives to that proposal. Information from the environmental assessment prepared for this proposed action also is incorporated and referenced herein.

#### **II. The Evaluation Process**

Section 810(a) of ANILCA states:

"In determining whether to withdraw, reserve, lease, or otherwise permit the use, occupancy, or disposition of public lands . . . the head of the Federal agency . . . over such lands . . . shall evaluate the effect of such use, occupancy, or disposition on subsistence uses and needs, the availability of other lands for the purposes sought to be achieved, and other alternatives which would reduce or eliminate the use, occupancy, or disposition of public lands needed for subsistence purposes. No such withdrawal, reservation, lease, permit, or other use, occupancy or disposition of such lands which would significantly restrict subsistence uses shall be effected until the head of such Federal agency:

1. gives notice to the appropriate State agency and the appropriate local committees and regional councils established pursuant to Section 805;
2. gives notice of, and holds, a hearing in the vicinity of the area involved; and
3. determines that (A) such a significant restriction of subsistence uses is necessary, consistent with sound management principles for the utilization of the public lands, (B) the proposed activity would involve the minimal amount of public lands necessary to accomplish the purposes of such use, occupancy, or other disposition, and (C) reasonable steps would be taken to minimize adverse impacts upon subsistence uses and resources resulting from such actions."

ANILCA created new units and additions to existing units of the national park system in Alaska. Denali National Park and Preserve additions were created by ANILCA Section 202(3)(a) for the purposes of:

"The park additions and preserve shall be managed for the following purposes, among others: To protect and interpret the entire mountain massif, and additional scenic mountain peaks and formations; and to protect habitat for, and populations of fish and wildlife, including but not limited to, brown/grizzly bears, moose, caribou, Dall sheep, wolves, swans and other waterfowl; and to provide continued opportunities including reasonable access, for mountain climbing, mountaineering, and other wilderness recreational activities."

Subsistence is an allowed use in the ANILCA additions to Denali National Park and Preserve (Sec. 202(3)(a)).

The potential for significant restriction must be evaluated for the proposed action's effect upon "... subsistence uses and needs, the availability of other lands for the purposes sought to be achieved and other alternatives which would reduce or eliminate the use." (Sec. 810(a))

### **III. Proposed Action on Federal Lands**

The proposed action and alternatives are evaluated in the context of the Court's Order in Alaska State Snowmachine Association v. Babbitt, et al. (No. A99-59 CV (JWS), Order dated November 18, 1999). This Order voided the NPS's February 1999 temporary closure of most of the Old Park because the NPS failed to define traditional activity. The NPS published proposed regulations that define traditional activity and that permanently close the Old Park to snowmachine use (64 F.R. 61563 (November 12, 1999). Public comment on the proposed regulations closed on January 25, 2000.

The Proposed Action Alternative would define traditional activity and permanently close the former Mount McKinley National Park area to snowmachine use for traditional activities. This permanent snowmachine closure within the former Mt. McKinley Park would not change the current management policy regarding snowmachine use in the ANILCA additions to Denali National Park and Preserve. Neither the proposed action nor any of the following alternatives would directly affect subsistence activities, since lands within the former Mt. McKinley National Park are not open to subsistence use. However, under alternatives 1 and 2, the local abundance and availability of wildlife resources could be indirectly affected on lands open to subsistence use due to further displacement of wildlife from adjacent areas within the Old Park by use of snowmachines.

Other alternatives considered in the Environmental Assessment include:

#### Alternative 1: No Action

Under this alternative, the use of snowmachines for traditional activities would be allowed. No definition of traditional activity would be added to the NPS regulations.

Snowmachine use for traditional activities would be contingent on a determination by the superintendent of sufficient snow depth (generally 6-12 inches or more) to protect the underlying vegetation and terrain and on public notification of that determination (43 CFR 36.11(a)(2))

#### Alternative 2: Partial Closure of the Old Park to Snowmachine Use

Under this alternative, the Old Park would be closed to the use of snowmachines north of the crest of the Alaska Range and southwest of the drainage divide of the West Fork of the Chulitna River, based on a finding of detriment to park resources (Figure 3). No definition of traditional activity would be added to the NPS regulations. This action would leave about 180,000 acres of the approximately two million acre Old Park open to snowmachine use for traditional activities. The area left open to snowmachine use has experienced virtually all of the past snowmachine use in the Old Park.

Snowmachine use would be contingent on a determination by the superintendent of sufficient snow depth (generally 6-12 inches or more) to protect the underlying vegetation and terrain and on public notification of that determination (43 CFR 36.11(a)(2)).

#### Alternative 3: Temporary Closures of the Old Park to Snowmachine Use

Under this alternative, a series of twelve-month temporary closures would be instituted to the use of snowmachines for traditional activities in the Old Park. As required by ANILCA Section 1110(a), hearings would be scheduled for public testimony and findings would be published to support each temporary closure action. ). No definition of traditional activity would be added to the NPS regulations.

### **IV. Affected Environment**

#### Introduction

In the last five years, snowmachine use has expanded dramatically in and adjacent to the southeastern areas of the park, particularly in the area near Cantwell and Broad Pass. Along with increasing popularity for snowmobiling have come dramatic improvements in snowmachine technology. Greatly increased reliability, power and floatation ability in the newer snowmachines have made possible access to many more distant areas and operations in significantly steeper and higher terrain than in past years.

Open habitat, mountain slopes, and reasonably good snow deposition in the Broad Pass area have attracted increasing numbers of snowmachine riders from throughout the Parks Highway accessible areas of the state. Snowmachiners ride through the new park additions, which are open to snowmobiling and subsistence uses, enroute to mountain slopes and passes adjacent to and often within the former Mt. McKinley Park. Snowmachine groups also have expressed interest in other destinations further within the former park area such as Anderson Pass, Eielson Visitor Center, the Denali Park Road corridor, and Wonder Lake. Use of these other areas would increase snowmachine traffic through the ANILCA park additions.

### Park Environment

Denali National Park and Preserve is located in the interior of Alaska and is dominated by an east to west line of towering glaciated mountains known as the Alaska Range. The range rises abruptly from lowlands 500 to 2,000 feet in elevation to the pinnacle of Mount McKinley, North America's highest mountain, at 20,320 feet. The range is perpetually snowclad above approximately 7,000 feet on the north and 6,000 on the south. Glaciers are numerous and tend to be larger and longer on the south side of the range than on the north.

Moisture from the Gulf of Alaska is blocked by the Alaska Range causing a continental climate to the north of the range and more of a maritime climate to the south. Moisture laden air from the south results in greater levels of precipitation on the southern flanks of the range. The average annual precipitation at park headquarters is 15 inches, while at some higher elevations in the park, the total precipitation exceeds 80 inches and snowfall exceeds 400 inches. Normal snowpack throughout the region averages between 20 and 40 inches.

Vegetative cover in Denali is typical of interior Alaska taiga. Lowland floodplains are dominated by dense, deciduous or coniferous forest, or by a mixed forest of balsam poplar and white spruce. Upland forests tend to be more open with mixed or continuous stand of black spruce, white spruce, or aspen. Upland forests give way to shrub communities at elevations above approximately 2,400 feet. Glacial rivers flowing from the Alaska Range create broad floodplains that are sparsely vegetated. Tall shrub communities of willow and alder grow on moist slopes and along drainages, and low shrub communities of dwarf birch and willow grow at higher elevations or on dry slopes. Alpine tundra, composed of dryas and dwarf willow shrub, mat and cushion species, or grass and sedge mixes grows on slopes and ridges to about 6,000 feet. More than 650 species of flowering plants inhabit the slopes and valleys of the park.

The original Mount McKinley National Park was established in 1917 primarily as a refuge for large mammals. In 1980, ANILCA enlarged the Old Park to more than 6 million acres, and redesignated the area as Denali National Park and Preserve. The protected subarctic ecosystem of Denali provides habitat for 30 species of mammals, at least 152 species of breeding birds, 16 species of fish (twelve resident species and four anadromous Pacific salmon species), and 1 amphibian. The American peregrine falcon (*Falco peregrinus anatum*), the subspecies that nests in the Denali region, was formerly listed as an endangered species under the Endangered Species Act but was delisted as of August 25, 1999 (64 FR 46542). No Federally designated threatened or endangered species are known to occur within Denali National Park (pers. comm. Larry Bright, USFWS, Fairbanks, Alaska).

About 100 archeological sites are recorded within Denali National Park and Preserve. Archeological investigations conducted within and immediately adjacent to the park strongly suggest that sites dating from the Paleoarctic tradition (10,000 years before present) through the Protohistoric period (200 years before present) exist within the park. Excavations at the Dry Creek site, situated near the northeastern park boundary, have yielded one of Alaska's earliest dates, 11,000 B.P. The Carlo Creek site situated along the Nenana River on the eastern park boundary is dated at approximately 8,000 B.P. These sites may depict tool technologies and

subsistence patterns representing the earliest peopling of North America by means of the Bering Land Bridge.

Historically, the Denali area was used by several Athabaskan Indian groups. The Ahtna people of Cantwell arrived from the east, the Tanana people came into the area from the north traveling up the Nenana and Toklat Rivers, the Koyukon people who lived at Lake Minchumina ascended the McKinley-Foraker-Herron Rivers, the Upper Kuskokwim people who still live in Nikolai and Telida, approached the park from the west, and the Denaina people approached the park from the south. Subsistence activities included large mammal hunting, fishing, and small game trapping.

More comprehensive descriptions of the affected environment within Denali National Park and Preserve can be found in the following park documents:

- *Environmental Impact Statement (EIS) on the Entrance Area and Road Corridor Development Concept Plan for Denali National Park and Preserve, 1996.*
- *EIS on the South Side Denali Development Concept Plan, 1996.*
- *EIS on the Cumulative Impacts of Mining in Denali National Park and Preserve, 1990.*
- *An Overview and Assessment of Archeological Resources, Denali National Park and Preserve, Alaska, Research/Resources Management Report AR-16, Kristen Griffin, 1990.*
- *EIS on the Wilderness Recommendation, Denali National Park and Preserve, Alaska Planning Group, 1988.*
- *General Management Plan, Land Protection Plan, Wilderness Suitability Recommendation, Denali National Park and Preserve, 1986.*
- *Land Use in the North Additions of Denali National Park and Preserve: An Historical Perspective, Research/Resources Management Report AR-9, William Schneider, Dianne Gudgeon-Holmes and John Dalle-Molle, 1984.*

## **V. Subsistence Uses and Needs Evaluation**

### **Background Information**

The 1980 additions to Denali National Park and Preserve are open to subsistence uses in accordance with Section 202 (3)(a) of ANILCA. Lands within the former Mount McKinley National Park are closed to subsistence activities.

Denali National Park and Preserve has a total of about 320 eligible local rural residents who qualify for subsistence use of park and preserve resources. Denali's subsistence users primarily reside in the communities of Cantwell, Minchumina, Nikolai, and Telida. Other local rural



residents who do not live in these designated resident zone communities, but who have customarily and traditionally engaged in subsistence activities within the park, may continue to do so pursuant to a subsistence permit issued by the park superintendent. Individuals from McKinley Village, Nenana, Healy, and Tanana have received subsistence use permits.

Areas receiving the most extensive subsistence use activities are the northern park and preserve region near Lake Minchumina, and the southeastern park region near Cantwell. Primary subsistence resources harvested for the southeastern region are moose, caribou, bear and fish, with a limited number of households engaging in trapping of furbearers. Cantwell area subsistence users primarily use park lands in the Windy Creek, lower Cantwell Creek, and Bull River drainages. In the northern region, moose, fish, and furbearers are the major resources harvested, with trapping being a significant subsistence use activity. In the northern region, traplines extend throughout the ANILCA park and preserve additions up to the boundaries of the former Mt. McKinley National Park.

Overall, Denali's main subsistence species are moose, caribou, ptarmigan, spruce grouse, hare, and few species of freshwater fish. Large mammals account for 70% of the resources used and fish account for 21%. Marten, mink, red fox, wolf, lynx, weasel, wolverine, land otter, beaver, muskrat, and coyote are important fur animal resources.

The National Park Service recognizes that patterns of subsistence use vary from time to time and from place to place depending on the availability of wildlife and other renewable natural resources. A subsistence harvest in a given year may vary considerably from previous years because of such factors as weather, surface snow conditions for traveling, wildlife migration patterns, natural population cycles, and wildlife conservation practices of leaving a trapline fallow periodically.

#### Potential Impacts to Subsistence Users

For several years, subsistence users have expressed concerns about the impacts and conflicts of increasing snowmachine use on subsistence resources and subsistence activities. Members of Denali's Subsistence Resource Commission have specifically expressed concerns regarding the effects of increasing levels of snowmachine use in the Broad Pass/Cantwell area upon moose, furbearers<sup>A1</sup> and ptarmigan<sup>A2</sup> populations and their distributions.

To determine the potential impacts of the proposed action on existing subsistence activities, three evaluation criteria were analyzed relative to existing subsistence resources:

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<sup>A1</sup> Denali Subsistence Resource Commission Meeting Minutes, April 29, 1996.

<sup>A2</sup> Denali Subsistence Resource Commission Meeting Minutes, August 9, 1996,  
Denali Subsistence Resource Commission Meeting Minutes, June 28, 1993.

- the potential to reduce important subsistence fish and wildlife populations by (a) reductions in number, (b) redistribution of subsistence resources, or (c) habitat losses;
- what affect the action might have on subsistence fisherman or hunter access;
- the potential for the action to increase fisherman or hunter competition for subsistence resources.

## **1. The potential to reduce populations**

### **(a) Reduction in Numbers:**

Neither the proposed action for a permanent snowmachine closure in the Old Park area nor any of the other alternatives are expected to cause a direct reduction to wildlife populations, although individual animals may be adversely affected. If anything, the closure of the Old Park to snowmobiling is likely to provide a refuge area for wildlife species displaced by increasing snowmachine use in the adjacent ANILCA park/preserve additions.

### **(b) Redistribution of Resources:**

A long research history documents that many species move back and forth between the Old Park and the new additions of Denali National Park and Preserve in a manner that creates an interrelated system. The permanent closure of the former Mt. McKinley Park area to snowmobiling would provide areas of undisturbed habitat thereby reducing displacement distance for certain wildlife species and/or stress to animals created by snowmachine traffic and activity in the adjacent park/preserve additions.

In particular for the Cantwell area, the closure would be beneficial for maintaining preferred or critical winter ranges for moose and caribou along the Alaska Range, and secondarily for furbearers throughout this area. The closure also would be beneficial for nesting habitat of ptarmigan during early spring and for bear movements during and after emergence from their dens. The increased ability for wildlife to remain in their preferred habitats would likely provide a positive effect on distribution, densities, and availability of wildlife for subsistence use.

Without a closure on snowmachine use in the Old Park, the noise and presence of an anticipated increasing amount of snowmachine traffic would temporarily and locally displace wildlife. Potential adverse impacts on wildlife most likely would occur during mid-to-late winter, when wildlife is likely to be in a nutritionally-stressed condition.

### **Caribou**

The Cantwell group of the Nelchina Caribou herd uses areas both within the former Mount McKinley National Park and the ANILCA park additions of Windy Creek, Cantwell Creek, and the Bull River drainages during late winter. These areas along the Alaska Range in the vicinity of Windy Pass provide important winter habitat for caribou, because snow depths associated with the pass area are less than in other areas.

Failure to implement the closure could result in increased snowmobiling in the Old Park area, which likely would cause further displacement of caribou from both old and new park lands. This, in turn, could result in Cantwell subsistence hunters having to travel further to harvest Nelchina caribou during the winter caribou season. In 1998, one hundred twenty Federal Registration Permits for caribou were issued to sixty subsistence users eligible to hunt in the ANILCA park additions near Cantwell. The Federal subsistence winter caribou season is open from October 21 to March 31.

#### Moose

Windy areas with reduced snow depths in Windy Creek, Cantwell Creek, Jack, and Nenana Rivers are important winter use areas for moose. Both local traditional knowledge and wildlife surveys recognize the importance of the Lower Windy Creek and Cantwell Creek areas as critical winter ranges for moose in Broad Pass. These important winter use areas overlap both Old Park and new park additions.

Failure to implement the closure could result in increased use of snowmachines which likely would cause further displacement of moose from both old and new park lands during late winter and from critical wintering areas on park lands in the Windy and Cantwell Creek drainages. This could significantly increase the stress and nutritional demands upon moose and result in some moose mortality, depending on the environmental conditions and the body reserves of moose in a given year. In 1998, fifty-one Federal registration permits for moose were issued to fifty-one households eligible to hunt in the 1980 additions to Denali National Park near Cantwell.

#### Furbearers

Limited information is available on populations of furbearers or their distributions for the southern regions of the park. However, several local subsistence trappers from the Cantwell area have stated they curtail their trapping efforts in mid winter due to displacement of furbearers as a result of increased recreational snowmobiling in the Broad Pass area<sup>A3</sup>. Without a snowmachine closure in the Old Park areas, furbearers likely would be displaced even further than they currently are from the Cantwell region.

#### Ptarmigan

Due to concerns about the declining number of ptarmigan in Wildlife Management Unit 13, hunting bag limits have been reduced and the season shortened to close on March 31. One of the reasons for shortening the season from April 30 to March 31 was to avoid hunting and activity during the nesting period in April. Failure to implement the closure could result in increased snowmobiling in the alpine zones of the park areas during April. This could have a negative affect by causing displacement of ptarmigan populations during their sensitive breeding and nesting period<sup>A4</sup>.

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<sup>A3</sup> Denali Subsistence Resource Commission Meeting Minutes, April 29, 1996.

<sup>A4</sup> Denali Subsistence Resource Commission Meeting Minutes, August 9, 1996;

Permanently closing the former Mount McKinley National Park (Old Park) to snowmobiling (Alternative 4) and/or instituting temporary closures of the Old Park to snowmobiling (Alternative 3), are not expected to have an adverse impact on wildlife populations or to cause the temporary redistribution of subsistence resources from those lands.

No action (Alternative 1) and partial closure of the Old Park (Alternative 2) are not expected to have an adverse impact on wildlife populations, but likely would result in the temporary redistribution of some subsistence resources.

**(c) Habitat Loss:**

Neither the proposed action nor any of the alternatives would result in significant habitat loss.

**2. Restriction of Access:**

All of the alternatives, including the proposed alternative for a permanent snowmachine closure, would be in effect on lands within the former Mount McKinley National Park. This area is not open to subsistence use activities. None of the alternatives would change the current management policy regarding snowmachine use in the ANILCA additions to Denali National Park and Preserve.

Access for subsistence uses on the ANILCA park and preserve additions is granted pursuant to Sections 811(a)(b) and 1110(a). Section 811(b) of ANILCA states that "rural residents engaged in subsistence uses shall have reasonable access to subsistence resources on the public lands." Section 1110(a) of ANILCA authorizes the use of snowmachines for traditional activities during periods of adequate snow cover.

The proposed permanent closure and the temporary snowmachine closure within the Old Park likely would mitigate the distance some wildlife species would be displaced and increase the availability of critical winter habitat for moose and caribou in the Cantwell and Broad Pass area. Increased snowmobiling within the adjacent ANILCA park additions may cause the temporary displacement of certain wildlife species to other areas both within and outside of Denali National Park, resulting in some subsistence users having to travel greater distances to locate and harvest resources. However, these alternatives are not expected to significantly restrict subsistence opportunities in the park or preserve.

The No Action Alternative and the Partial Closure of the Old Park Alternative have the potential to displace local wildlife resources even further from the new park and preserve additions which are opened to subsistence activities. This could result in less wildlife being locally available to the park and preserve additions, which in turn could result in local subsistence users having to travel even further to locate and harvest subsistence resources. The displacement of wildlife due

to increasing snowmachine use within the Old Park would be one more factor, in addition to the naturally occurring conditions, which would contribute to the potential change in patterns of subsistence use. However, neither of these alternatives is expected to result in significantly restricting subsistence opportunities in the park or preserve additions.

### **3. Increase in Competition:**

#### **Hunting**

None of the alternatives would result in an increase in competition for subsistence hunting or trapping on ANILCA park additions since park lands are only open to NPS-eligible subsistence users. Due to the remoteness of Denali's preserve lands and the distance of these lands from hunters, they are not accessed by passage through the former Mt. McKinley Park area. No increase in competition is expected in the preserve for subsistence or sport hunting and trapping as a result of any of these alternatives.

All of the alternatives have the potential to focus recreational snowmachine activities into the regions of the park and preserve where subsistence uses occur. Introducing new recreational uses into these areas increases the potential for conflict between consumptive and non-consumptive users. Subsistence trappers may be adversely affected during certain times of the year by displacement of furbearers, and subsistence hunters also may be adversely affected during winter hunting seasons by the temporary displacement of wildlife, particularly moose and caribou. This could result in less wildlife being locally available in the park and preserve additions, which, in turn, could result in local subsistence users having to travel further to locate and harvest subsistence resources.

To minimize potential conflicts, recreational snowmobiling visitors planning trips into Denali would need to be educated about authorized subsistence use activities and use areas within the park and advised of current hunting and trapping seasons.

### **VI. Availability of Other Lands and Alternatives to the Proposed Action**

No other lands practically can be substituted for the proposed action. No other lands could serve the purposes sought to be achieved because it is the Old Park's specific resource values that the NPS seeks to protect from detriment through the proposed action (permanent closure of the Old Park to snowmachine use). Neither the proposed action nor other alternatives are expected to result in significant adverse impacts on subsistence uses.

### **VII. Findings**

This analysis concludes that the proposed action would not result in a significant restriction of subsistence uses. This is because the closure would occur on lands within the Old Park, and these lands are not open to subsistence use.