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National Park Service  
U.S. Department of the Interior

Denali National Park and Preserve  
Alaska

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**Winter Road Plowing  
Environmental Assessment  
January 2013**

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As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural and cultural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to assure that their development is in the best interests of all. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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## **I. PURPOSE AND NEED**

The National Park Service (NPS) is considering plowing the Denali Park Road (Park Road) in Denali National Park & Preserve (park) to the Mountain Vista Rest Area at mile 12 during winter months. (see Figure 1 on page 11 for project location). Private and commercial vehicles would be allowed to travel into the park during times of the year that commercial transportation is not presently available. All action alternatives considered in this plan are designed with the following goals:

- Increase the range of opportunities for winter visitors by adding the option of motorized sightseeing
- Provide increased opportunities for winter visitors to view Mt. McKinley when visiting the park

The purpose of this plan is to maintain the opportunities for physically active and/or backcountry winter recreationalists while at the same time allowing more visitors in vehicles access to an additional nine miles of the Park Road. This plan is necessary to address the needs of visitors to the park in winter when opportunities for them may be limited due to the cold temperatures and reduced daylight. They may visit the kennels; however, the dogs are frequently gone on patrols. Outdoor recreational opportunities such as hiking and snowshoeing are available but require visitors to be prepared for extreme temperatures. The park does get a number of visitors, predominantly from the local area, who cross country ski, skijor, snowshoe, or dog mush into the park. The Park Road is closed in the fall when it becomes snowed in (usually between mid-October and mid-November) and then re-opened beginning around April 1. Local governments and businesses have expressed an interest in bringing visitors to the park during the winter months for mountain viewing.

This Environmental Assessment (EA) analyzes a No Action Alternative and three action alternatives for winter road plowing to mile 12 within Denali National Park and has been prepared in accordance with the National Environmental Policy Act of 1969 and Council of Environmental Quality regulations (40 CFR 1508.9).

### **Background**

Denali National Park and Preserve, just over 6 million acres, is one of the largest national parks in the United States. The park includes North America's highest mountain, 20,320-foot tall Mount McKinley. Denali is one of only four national parks in Alaska accessible by road. The Denali Park Road is 92 miles long and parallels the Alaska Range. Along its route, beautiful landscapes can be seen at every turn, and there are many opportunities to view Mount McKinley - if the normally cloudy skies permit. Wildlife can often be seen, too, though sightings are not guaranteed.

Winter is a powerful season in Denali. For much of the year, Denali's landscape is blanketed in snow, its rivers and lakes locked in thick ice, its animals in hibernation, long-since migrated, or making the best existence they can in temperatures that routinely reach -40 F. Winter is outside the "normal" season for travelers, but for someone seeking natural beauty, tranquility, stillness, solitude, and a challenge, winter in Denali can be a wonderful time.

Currently in the fall private vehicles are allowed on the Park Road as far as Teklanika Rest Stop (mile 30) once the commercial vehicle season has ended in mid-September. The road is not plowed and once snow begins to accumulate the road is closed at mile 3, the gate at park headquarters. Maintenance staff access the area to mile 7 all winter to remove snow accumulations between mile 4 and 7, and begin plowing the road for spring road opening in mid-March. Once the snow has been removed the road is initially opened to the Savage River Bridge around April 1, and then opened as far as Teklanika Rest Stop around April 15. Private vehicles are not allowed on the unpaved road west of the Savage River Bridge when buses start running around May 15.

Visitor opportunities in winter include Winterfest in February, visiting the dog kennels, hiking, snowshoeing (including ranger led activities), skiing, skijoring, dog mushing (including guided trips), winter camping in the backcountry or at Riley Creek Campground, and visiting the winter visitor center.

Currently the road is zoned as a backcountry hiker area once the gate is closed at park headquarters. It is used in winter for non-motorized outdoor recreation such as skiing, hiking, skijoring, and dog mushing. There are various other trails used in winter and users can establish trails as they like. As conditions allow, kennel staff establish the route on the brushed portion of the Spring Trail through the forested area from the Kennels parking lot to approximately mile 7. After that point the trail emerges into treeless landscape and is established as kennel staff deems appropriate up to the Mountain Vista area to utilize the Savage Cabin. Traveling farther into the park requires crossing the Savage River to access the normal patrol route.

### **Park Purpose and Significance**

Denali National Park and Preserve is a vast area that provides visitors of all abilities with opportunities for superlative, inspirational experiences in keeping with its legislative mandates. Over the long term, preservation of the wilderness character and intact functioning ecosystem are essential to providing the opportunity for outstanding resource-based visitor experiences.

In 1917, Congress established Mount McKinley National Park: "...as a public park for the benefit and enjoyment of the people... said park shall be, and is hereby established as a game refuge" (39 Statute 938). Additions to the park were made in 1922 and 1932 to provide increased protection for park values and, in particular, wildlife.

The Alaska National Interest Lands and Conservation Act of 1980 (ANILCA) added approximately 2,426,000 acres of public land to Mount McKinley National Park and approximately 1,330,000 acres of public land as Denali National Preserve and re-named the whole unit as Denali National Park and Preserve. ANILCA also directed the NPS to preserve the natural and cultural resources within the park for the benefit, use, education, and inspiration of present and future generations and designated 99% of the former Mount McKinley National Park as wilderness.

## **Legal Context**

National Park Service Concessions Management Improvement Act of 1998. The Act regulates the authorization of commercial services within a unit of the NPS. Title 16, Chapter 79, Subchapter III, Section 5951, Congressional findings and statement of policy requires:

### (a) Findings

.....the Congress hereby finds that the preservation and conservation of park resources and values requires that such public accommodations, facilities, and services as have to be provided within such units should be provided only under carefully controlled safeguards against unregulated and indiscriminate use, to that-

- (1) visitation will not unduly impair these resources and values; and
- (2) development of public accommodation, facilities and services within such units can best be limited to locations that are consistent to the highest practicable degree with the preservation and conservation of the resources and values of such units.

### (b) Policy

It is the policy of the Congress that the development of public accommodations, facilities and services in units of the National Park System shall be limited to those accommodations, facilities and services that –

- (1) are necessary and appropriate for public use and enjoyment of the unit of the National Park System in which they are located; and
- (2) are consistent to the highest practicable degree with the preservation and conservation of the resources and values of the unit

### 36 CFR Part 5.4(a)

The Code of Federal Regulations [36 CFR 5.4(a)] prohibits commercial transportation in certain areas of the National Park System, including the Denali Park Road, without specific authorization. The Code of Federal Regulations defines transportation as commercial "if it is operated primarily as a business activity or for profit of the operator, or if any person or organization may receive a profit, commission, fee, brokerage, or other compensation for promoting, soliciting, or selling the trip or tour of which such transportation is a part" [36 CFR 5.4(a)(1)].

NPS Management Policies, Chapter 10. A service provided by a commercial provider in a national park must be all of the following:

- Consistent with enabling legislation
- Complementary to a park's mission and visitor service objectives
- Necessary and appropriate for the public use and enjoyment of the park in which it is located
- Not, and cannot be, provided outside the park boundaries
- Will not cause unacceptable impacts

Denali National Park & Preserve General Management Plan, 1986

This plan provides comprehensive guidance for all aspects of park management. It creates park zones, identifies resource management needs, and summarizes interpretive objectives and the desired visitor experience

Denali National Park & Preserve Backcountry Management Plan, 2006

Denali's Backcountry Management Plan (BCMP) states: "During winter months snow on one lane of the Park Road will continue to be packed from the Headquarters gate to Mile 7 to allow maintenance activities that prevent the buildup of ice on the road in this section. If there is sufficient snow on the spring trail from Headquarters for safe travel by ski, skijor, and dog sled by March 1, the road would be plowed to Savage Campground. Otherwise, the Park Road would remain unplowed until clearing is needed to provide for road opening activities for summer season use. This section of the Park Road will be designated a Backcountry Hiker area during winter months."

Denali National Park & Preserve Development Concept Plan for the Entrance Area and Road Corridor, 1997

The DCP describes the plan for providing for visitor use and resource protection and related facility development in the entrance area and road corridor or frontcountry of Denali National Park and Preserve. This plan included new public transportation from the entrance area to Savage River Rest Stop along with trailheads to encourage visitors to leave their cars and explore parts of the park to further the enhancement of visitor opportunities along the first 15 miles of the Park Road. These would include trail construction, wider road shoulders, new picnic areas, and improvements to rest areas to provide additional opportunities for leisurely day use experiences viewing animals and landscapes.

Environmental Assessment for Construction of a Springtime Dogsled and Skiing Trail from Headquarters to Mile 7 of the Park Road, 2002

The NPS approved alternative in the FONSI for the Spring Trail EA will improve the trail to parallel the Park Road for 4 1/4 miles from Park Headquarters to mile 7.63, with all but one mile in designated wilderness. According to the plan, "Curves in the trail will be broad and sweeping to provide adequate sight distance and passing width for dog teams as well as cross-country skiers and snowshoers. The alignment will minimize steep grades and cross slopes and will minimize problems with aufeis.

Trail construction work will be limited to brushing and clearing an eight-foot wide corridor, and cutting the tops off the largest tussocks to level the trail as necessary. Work will be undertaken in winter after the surface of the ground is frozen. Tussocks will be cut using grub hoes and pulaskis and the cut material will be moved to fill the low spots. Brush and trees will be cut with motorized brush cutters, chainsaws, handsaws and polesaws. The use of those mechanized/motorized tools was approved in a project-specific minimum requirement analysis.

Brush will be scattered out of sight and firewood-size wood will be stacked near the trail and hauled by dog sled during the winter to Park Headquarters or to ranger patrol cabins. Temporary wooden plank bridges will be used at the three creek crossings until there is adequate snow and ice to cover the floodplain boulders. No borrow material will be needed for the construction, and no revegetation work will be part of the plan. The trail will not be signed or mapped for summer use.

Of the 4 1/4 miles of trail, approximately 3 miles will follow previous clearing work, although the full length will need to be brought to the 8 foot wide standard. The trailhead for visitors will be at the parking area used by the Dog Demonstration buses in the summer.”

### **Appropriate Use**

The legal and policy framework that governs the authorization of commercial activities within Denali consist of the following:

- National Parks Omnibus Management Act of 1998, Public Law 105-391, Title IV, National Park Service Concessions Management
- NPS Management Policies 2006, Chapter 10, Commercial Visitor Services

The NPS Management Policies 10.2.2 mandates commercial visitor services planning for national parks and preserves. Commercial services may be authorized as concession contracts or commercial use authorizations. A decision to authorize a concession is to be based on a determination that the service:

- is necessary and appropriate for public use and enjoyment of the park in which it is located and identified needs are not, nor can they be, met outside park boundaries,
- will be provided in a manner that furthers the protection, conservation, and preservation of the environment and park resources and values, and
- will enhance visitor use and enjoyment without causing unacceptable impacts to park resources or values.

### **Scoping**

The public scoping period for this project occurred from February 7 to March 9, 2012. A news release was issued and a mailing list of individuals and companies interested in the project was utilized to inform the public of the project. The news release was sent to 40 media outlets which included newspapers, wire services, radio, TV, and online publications. It was also sent to local, state and federal agencies, Alaskan military bases, and political officials. In addition, over 100 businesses and organizations received the news release via email. A public meeting was held on Wednesday, February 22, from 6:00 to 8:00 pm at the Murie Science and Learning Center in Denali National Park with 17 members of the public participating. The Planning Environment and Public Comment (PEPC) website was utilized to collect the 43 public comments that were received. Many comments suggested new ideas and alternatives and those concepts that were within the scope of this project were considered.

Comments are summarized with the following statements:

- Visitor safety during winter months may be affected by providing easy access on the Park Road where communication and assistance is not readily available.
- Wilderness character may be affected with additional improvements to the Spring Trail.
- Commercial use on the Park Road in winter may require new infrastructure to support larger vehicles and larger groups of visitors.
- Air quality may be affected by idling vehicles at the Mountain Vista Rest Area.
- Wildlife may be affected by changes in areas used for recreation and further disturbance by motor vehicles.
- The natural soundscape may be affected.
- Plowing from mile 3 – mile 12 may both positively and negatively affect the visitor experience and visitor access to winter recreation.
- Expanded winter opportunities in the park may affect the local, regional, and statewide economy and may increase the diversity of visitors who experience the park.

### **Impact Topics Retained for Further Analysis**

To focus this EA, the NPS selected specific issues (also called “Impact Topics”) for further analysis and eliminated others from evaluation. Issues selected for analysis in this EA were determined through internal scoping with the park and NPS Alaska Region staff.

Visitor Experience & Opportunity – The experience of both the visitor traveling by vehicle and the visitor traveling on the land may be affected by this plan.

Wilderness Character – Outstanding opportunities for solitude or a primitive and unconfined type of recreation may be affected by allowing vehicles further into the park during winter and by additional improvements to the Spring Trail.

Soundscapes – Additional vehicles on the road may affect the winter soundscape.

Socioeconomics – Local and area businesses may be affected by this plan.

Cultural Resources – Improvements to the Spring Trail have the potential to affect cultural resources.

Vegetation, Wetlands & Soils – Improvements to the Spring Trail may affect vegetation and soils.

### **Impact Topics Dismissed from Further Analysis**

The following issues have been considered but dismissed from detailed analysis. Issues dismissed from detailed analysis are not addressed further in this EA.

Threatened and Endangered Species - No federally designated threatened or endangered species are known to occur within the park and none are anticipated to be affected by this plan.

Air Quality - Both the Clean Air Act of 1977 (CAA) and NPS 2006 Management Policies (NPS 2006b) require the NPS to consider air quality impacts from their projects. Mitigation measures are included in this plan which would result in no new air quality impacts.

Wildlife and Habitat – Wildlife and habitat would not be affected by this plan since animals are used to vehicles traveling on the road and the speed limit is low.

Water Quality – No impacts to water quality would occur due to this plan.

Environmental Justice - Executive Order (E.O.) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations, requires all federal agencies to identify and address disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. The proposed plan would not result in any changes in the socioeconomic environment of the area, and is expected to have no direct or indirect impacts to minority or low-income populations or communities.

Floodplains - E.O. 11988, Floodplain Management, requires all federal agencies to take action to reduce the risk of flood loss, to restore and preserve the natural beneficial values served by floodplains, and to minimize the impact of floods on human safety, health, and welfare. This project does not occur in a floodplain.

Subsistence - Subsistence activities are not affected by this plan. An ANILCA §810 evaluation is included in Appendix B.

Figure 1 – Project Area Overview

# Denali National Park & Preserve Winter Road Plowing Project Area

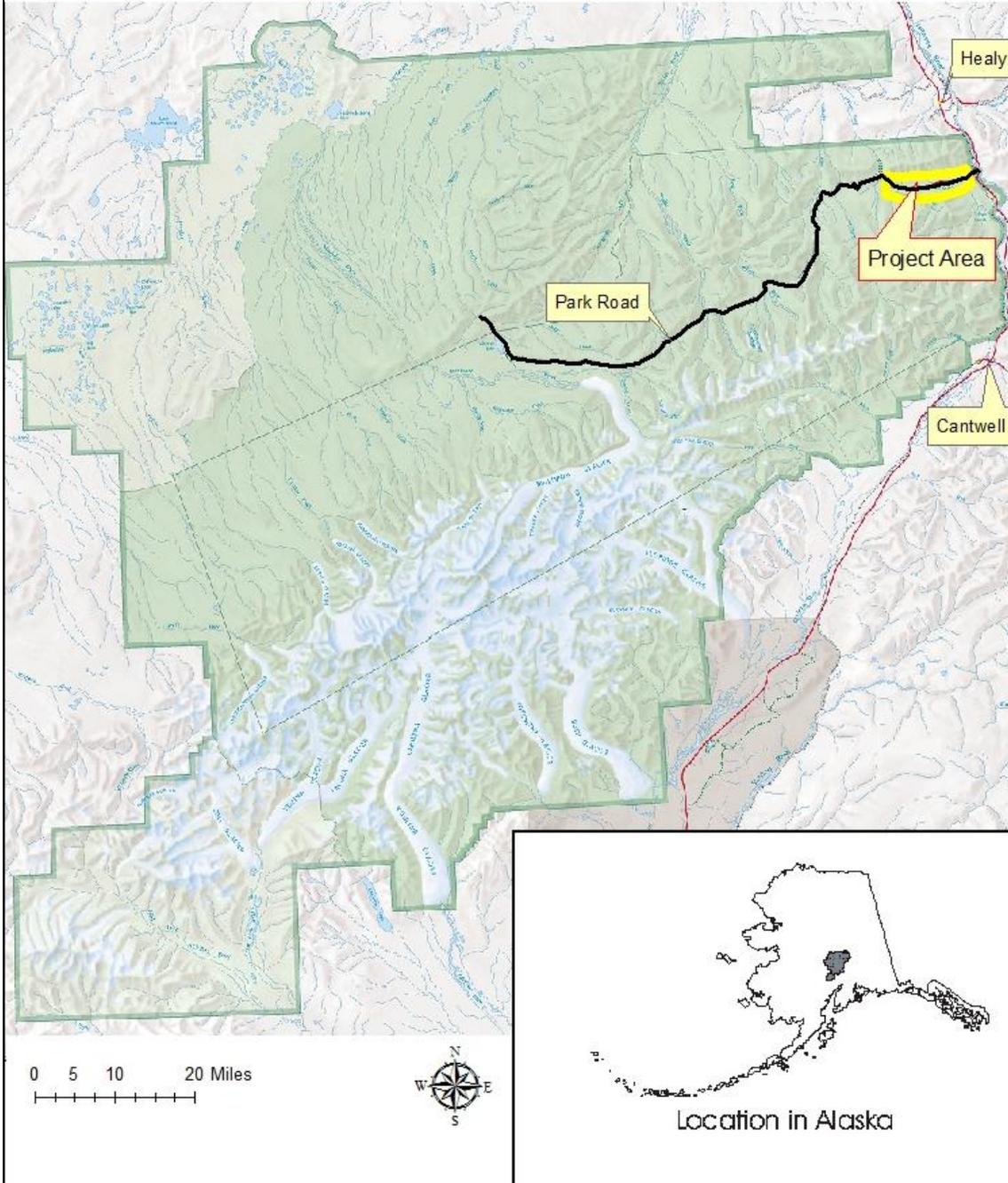
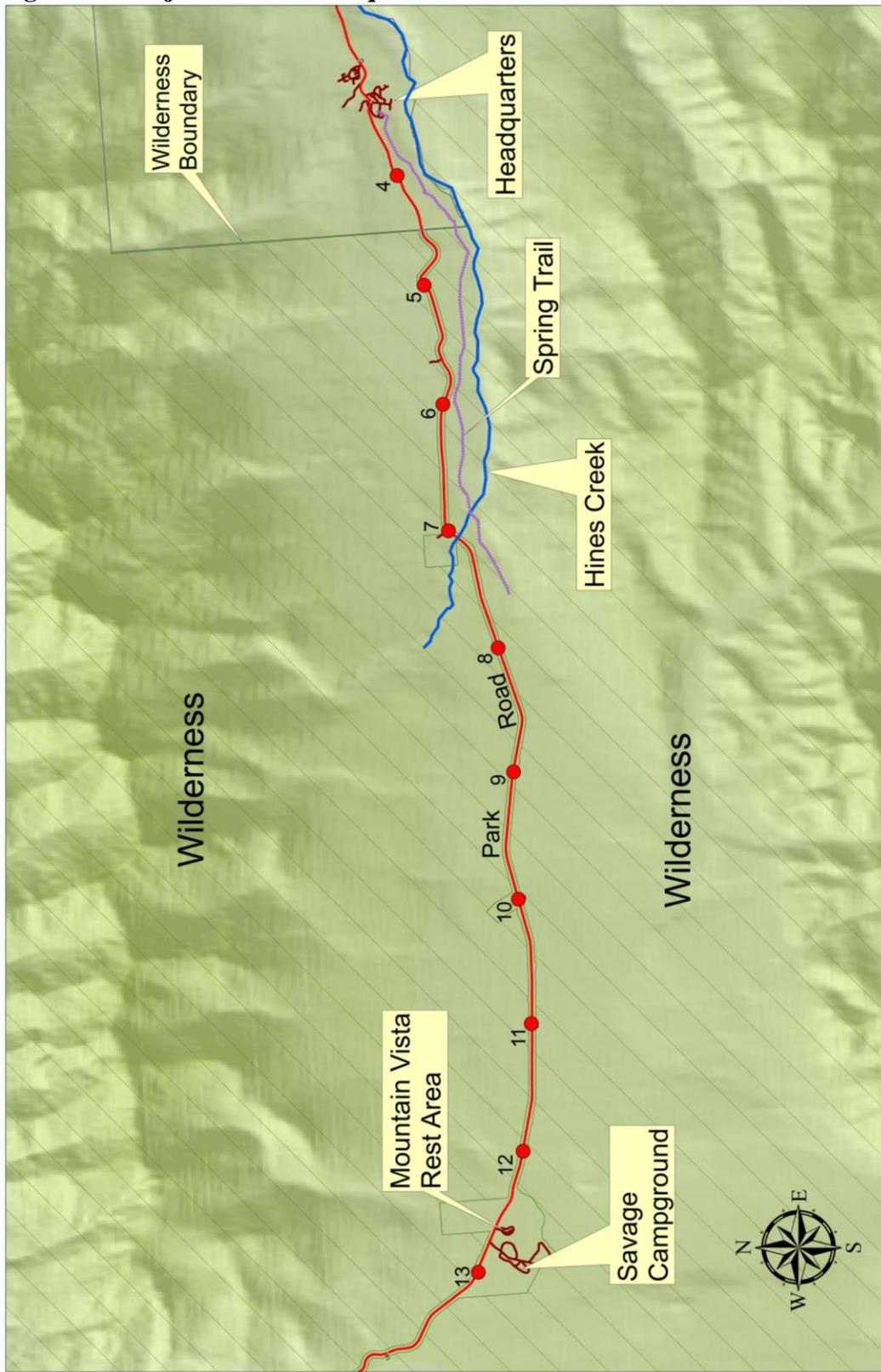


Figure 2 – Project Area – Headquarters to Mountain Vista Rest Area



## II. DESCRIPTION OF THE ALTERNATIVES

### Actions Common to all Alternatives

- Park staff would work towards better park promotion for winter visitation to dispel the perception that the park is closed in the winter.
- Park staff would provide printed and online information on proper clothing and equipment to enhance the experience for winter visitors.
- The *2002 Environmental Assessment for Construction of a Springtime Dogsled and Skiing Trail from Headquarters to Mile 7 of the Park Road* would be implemented. This would include the following trail improvements: brushing, opening the canopy, and use of planks for seasonal bridges over aufeis areas and drainages.
- Commercial operations would be authorized under Commercial Use Authorizations.
- If specialized kennels tours are provided for commercial groups, the increased operational costs would be offset with an Amenity Fee.

### Alternative 1 – No Action – No plowing past park headquarters (mile 3)

During winter months snow on one lane of the Park Road will continue to be packed from mile 3 to mile 7 to allow maintenance activities that prevent the buildup of ice on the road. This section of the Park Road would continue as a designated backcountry hiker area during winter months. It would remain unplowed until clearing is needed to provide for spring snow removal operations, which can begin as early as March 1.

### Alternative 2 – Plow road for full winter season and allow additional improvements to the Spring Trail

Under Alternative 2, the NPS would keep the Denali Park Road open to the Mountain Vista Rest Area year round. The road would be plowed at a level 3 priority (see Table 1) with additional staffing. An emergency communication device with direct connection to the park communications center may be installed at Mountain Vista Rest Area. The existing shelter at Mountain Vista Rest Area may be seasonally modified into a warming hut. No plug-ins would be installed at the rest area. Additional work on the Spring Trail would include the relocation of boulders and realignment of up to 1000 feet of trail near Hines Creek to improve usability. Paved sections of Riley Creek Campground not used for winter camping would be groomed using construction equipment and drag to serve as an alternative to the Park Road for beginner skiers and skijorers. The road from mile 3 to mile 12 would no longer be part of the winter backcountry hiker area as designated in the Backcountry Management Plan. Spring Trail improvements would be completed prior to the opening of the road for winter visitors for the full winter season.

Implementation of this alternative may include a phased approach with a trial period as outlined in Alternative 4, followed by a mid-January start date as outlined in Alternative 3 prior to opening the road for the full season in out years.

Implementation will also be dependent on available funding resources. At present, Denali National Park & Preserve does not allocate funds to keep the road cleared for private and commercial vehicle traffic in winter to mile 12. To do so in the future would require a reallocation of funding away from other park priorities. Before committing to this course of

action, park managers may conduct a financial feasibility study to inform this decision. The feasibility study would consider operational costs and visitation/use projections. NPS would involve stakeholders in the review. Commercial operators may be asked to assist with the increases operational costs for this project (Estimated startup and annual costs of alternatives are located in Appendix E.)

**Table 1 – Plowing Priority Levels**

<b>Plowing Priority</b>	<b>Area to be Plowed</b>
Level 1	Park Road from Parks Highway to Park Headquarters
Level 2	Secondary roads and parking areas throughout the administrative and housing areas in Park Headquarters and C-Camp
Level 3	Park Road from Park Headquarters to Mountain Vista
Level 4	Residential area driveways and paths

**Alternative 3 – Plow road for partial winter season beginning mid-January with minor changes to the Spring Trail**

Under Alternative 3, the NPS would open the Park Road for vehicle use in mid-January to the Mountain Vista Rest Area with no additional staffing. The road would be plowed at a level 3 priority (see Table 1). An emergency communication device with direct connection to the park’s communication center may be installed at Mountain Vista Rest Area. No plug-ins would be installed at the rest area and no warming hut would be available there. Additional work to the Spring Trail would be limited to the relocation of boulders. Winter over-snow trails would be established by users and trail grooming would not occur. The road from mile 3 to mile 12 would not be a winter backcountry hiker area during these months.

Implementation of this alternative may include a phased approach with a trial period as outlined in Alternative 4.

Implementation will also be dependent on available funding. At present, Denali National Park & Preserve does not allocate funds to keep the road cleared for private and commercial vehicle traffic in winter to mile 12. To do so in the future could require a reallocation of funding resources away from other park activities. Before committing to this course of action, park managers may conduct a financial feasibility study to inform this decision. The feasibility study would consider operational costs and visitation/use projections. NPS would involve stakeholders in the review. Commercial operators may be asked to assist with the increase of operational costs for this project (Estimated startup and annual costs of alternatives are located in Appendix E.)

## **Alternative 4 (NPS Preferred) – Plow road on a trial basis for 3-5 years beginning mid-February**

Under Alternative 4, the NPS would open the Park Road to the Mountain Vista Rest Area for vehicle use in mid-February for a three – five year trial period. No additional staffing would be added and the road would be maintained at a level 3 priority (see Table 1) to provide safe driving on the snow and ice pack. No vehicle plug-ins would be installed at the rest area and there would be no warming hut or emergency communication device installed. No improvements to the Spring Trail beyond those outlined in the 2002 Spring Trail EA are anticipated under this alternative. Winter over-snow trails would be established by users and trail grooming would not occur. The road from mile 3 to mile 12 would not be part of the winter backcountry hiker area for the month of February.

Commercial operators would be required to carry an emergency communications device. The NPS will evaluate visitation data after the trial period to determine if opening the road earlier to visitors warrants the increased operational costs. Commercial operators may be asked to assist with the increase of operational costs for this project. (Estimated startup and annual costs of alternatives are located in Appendix E.) The park may undertake a financial feasibility study to determine if there are other viable options to fund the increased operational costs. Depending on the findings, the NPS may eliminate the plowing effort or continue it annually. If new information shows that an earlier opening may have positive results, the park would undertake additional compliance to evaluate an earlier date for plowing and opening the road.

### **Mitigation and Monitoring**

Mitigation measures are specific actions that when implemented reduce impacts, protect park resources, and protect visitors. The following mitigation would be implemented under each action alternative and are assumed in the analysis of effects.

#### Visitor Experience and Opportunity

- Visitor comments collected during winter months will be evaluated.
- In order to mitigate the effects to air quality and soundscape, no idling of private or commercial vehicles at Mountain View Rest Area will be allowed.
- To ensure safety, the road would close during storm events and/or when safe traveling conditions on the road could not be maintained such as during storms, rain/ice events or high winds.
- In the event of the road will close due to weather, park staff will first ensure no vehicles and visitors are at the Mountain Vista Rest Area.
- Road status would be available on the park website, social media, and by calling the park.

#### Wilderness Character

- Emergency communication device will be limited to devices that would not result in additional wilderness impacts such as a larger footprint at repeater sites, or monthly flights into wilderness to maintain equipment during winter months.

### Cultural Resources

- If cultural resources or items protected by the Native American Graves Protection and Repatriation Act are discovered during project implementation, all project-related activities in the vicinity of the discovery will stop and the park archaeologist will be notified immediately. Denali National Park and Preserve in consultation with the State Historic Preservation Officer will determine a course of action per 36 CFR Part 800.13.

### Wildlife

- Work on the Spring Trail would be done outside of the moose rutting season which typically runs from the end of August through the second week of October.
- Trail crew leader will contact park biologists prior to scheduling of work to determine if there are any additional wildlife concerns that will impact timing of the work on the Spring Trail.
- If wildlife begin to use the plowed road in winter as a primary travel route, a seasonal reduction in speed limit could be utilized.

### **Environmentally Preferable Alternative**

Considering that opening the road would result in more vehicles traveling farther into the park, which may affect wilderness character and solitude, and that work on the Spring Trail may affect vegetation, the environmentally preferable alternative would be the No Action Alternative.

### **Alternatives Considered and Dismissed**

#### Begin plowing only once Spring Trail suitable for use.

A specific date is more reliable for scheduling staff and allowing businesses to develop opportunities. A mid-January start date will be evaluated.

#### Use of over the snow vehicles (such as snow coaches) to transport visitors to Mountain Vista without displacing recreational use of Park Road.

Allowing motorized use on the road alongside mushers, skiers, and skijorers is a safety concern. It would also degrade the visitor experience of those participating in those non-motorized activities. Oversnow vehicles are currently allowed on Stampede out to the Sushana River without an NPS permit. No business is running these types of trips which could indicate it is not a feasible business opportunity.

#### Create a roadside path for skiing from headquarters to mile 7 which could also be utilized in the summer for walking of kennel dogs.

A trail adjacent to the road would encounter serious afeis issues. A new policy allowing dogs on trails would need to be developed. As of now, this idea is out of the scope of this project.

#### Keep one lane open for skiers and mushers by plowing only 1.5 lanes and implement rules of the road similar to beyond Teklanika.

This could be feasible if the commercial vehicles were operated by a concessioner with trained drivers. However, it is the intention of this project to also allow members of the public to drive their vehicles into the park as well. This proposal poses a safety concern and would degrade the visitor experience of those participating in non-motorized activities on the Park Road.

**Table 2 –Components of the Alternatives**

<b>Component</b>	<b>No Action- Alt. 1</b>	<b>Alternative 2</b>	<b>Alternative 3</b>	<b>Alternative 4 (NPS Preferred)</b>
<b>Plowing Season</b>	Begins early to mid-March	Full Season from after road lottery in September 15 and allow commercial and private vehicles on road until mid-May	Begin mid-January and allow commercial and private vehicles on road until mid-May	Begin mid-February and allow commercial and private vehicles on road until mid-May for a period of 3 to 5 years
<b>Plowing</b>	Continue to plow to maintain aufeis between mile 4 and 7	Plow on a high priority basis with additional staffing if needed	Plow on a priority basis with no additional staffing	Plow on a priority basis with no additional staffing
<b>Amenities at Mountain Vista Rest Area</b>	None	-Emergency phone or radio with direct connection to park communications center -Shelter made into seasonal warming hut	Emergency phone or radio with direct connection to park communications center	No additional amenities
<b>Spring Trail</b>	Brushing, open canopy, and use of planks over creek boulders and ice	Relocation of boulders, brushing, open canopy, use of planks, minor trail realignments up to 1000 ft	Relocation of boulders, brushing, open canopy, use of planks over creek boulders and ice	Brushing, open canopy, use of planks over creek boulders and ice
<b>Other recreation opportunities</b>	Winter over-snow trails established by users	Paved sections of Riley Creek Campground not used for winter camping could be groomed using construction equipment and drag	Winter over-snow trails established by users	Winter over-snow trails established by users
<b>Backcountry Management Plan</b>	No change	The road from mile 3 to 12 will no longer be part of the winter backcountry hiker zone	The road from mile 3 to 12 will not be part of the winter backcountry hiker zone during the months the road is open	The road from mile 3 to 12 will not be part of the winter backcountry hiker zone during the months the road is open

**Table 3 – Summary of Alternative Impacts**

<b>Impact Topic</b>	<b>Alt 1 – No Action</b>	<b>Alt 2 – Plow for full season</b>	<b>Alt 3 – Plow for partial season</b>	<b>Alt 4 – Plow short season, trial basis (NPS Preferred)</b>
<b>Visitor Opportunities</b>	No Change	Moderate, long-term, beneficial impacts	Minor, long-term, beneficial impacts	Minor, long-term, beneficial impacts
<b>Wilderness Character</b>	No Change	Moderate, long-term, adverse impacts	Minor, long-term, adverse impacts	Minor, long-term, adverse impacts
<b>Soundscapes</b>	No Change	Moderate, long-term, adverse impacts	Minor, long-term, adverse impacts	Minor, long-term, adverse impacts
<b>Socio-economics</b>	No Change	Moderate, long-term, beneficial impacts	Minor, long-term, beneficial impacts	Minor, long-term, beneficial impacts
<b>Cultural Resources</b>	No Change	Negligible	Negligible	No Change
<b>Vegetation, Wetlands &amp; Soils</b>	No Change	Minor, long-term, adverse impacts	Negligible	No Change

### III. AFFECTED ENVIRONMENT

This section summarizes the natural and human environment that may be affected by the proposal and alternatives under consideration.

#### Visitor Experience & Opportunity

For many decades Denali National Park has been a place for backcountry winter use. Many users are from the local area and use the Park Road for skiing, skijoring, or dog mushing. Factors which may have contributed to the Park Road becoming the main route for recreational users during the winter include:

- it is a wide path ideal for beginning skiers and skijorers
- aufeis between miles 4 and 7 requires year round maintenance and park staff groom the trail as they exit the road
- it can be utilized with a relatively small accumulation of snow because the road surface is flat and the first 4 miles past park headquarters are in the trees where wind effects are muted.

Data collected at the Murie Science & Learning Center (MSLC), which serves as the winter visitor center, shows there are significant levels of visitation during winter months (see Table below).

**Table 4 – Winter Visitor Data**

#### A. Winter Visits to the MSLC

<b>Month</b>	<b>Winter 2010-2011</b>	<b>Winter 2011-2012</b>	<b>Average for these two seasons</b>
October	551	499	525
November	128	143	136
December	111	148	130
January	135	167	151
February	325	452	389
March	593	696	645
<b>TOTAL</b>	<b>1843</b>	<b>2105</b>	<b>1976</b>

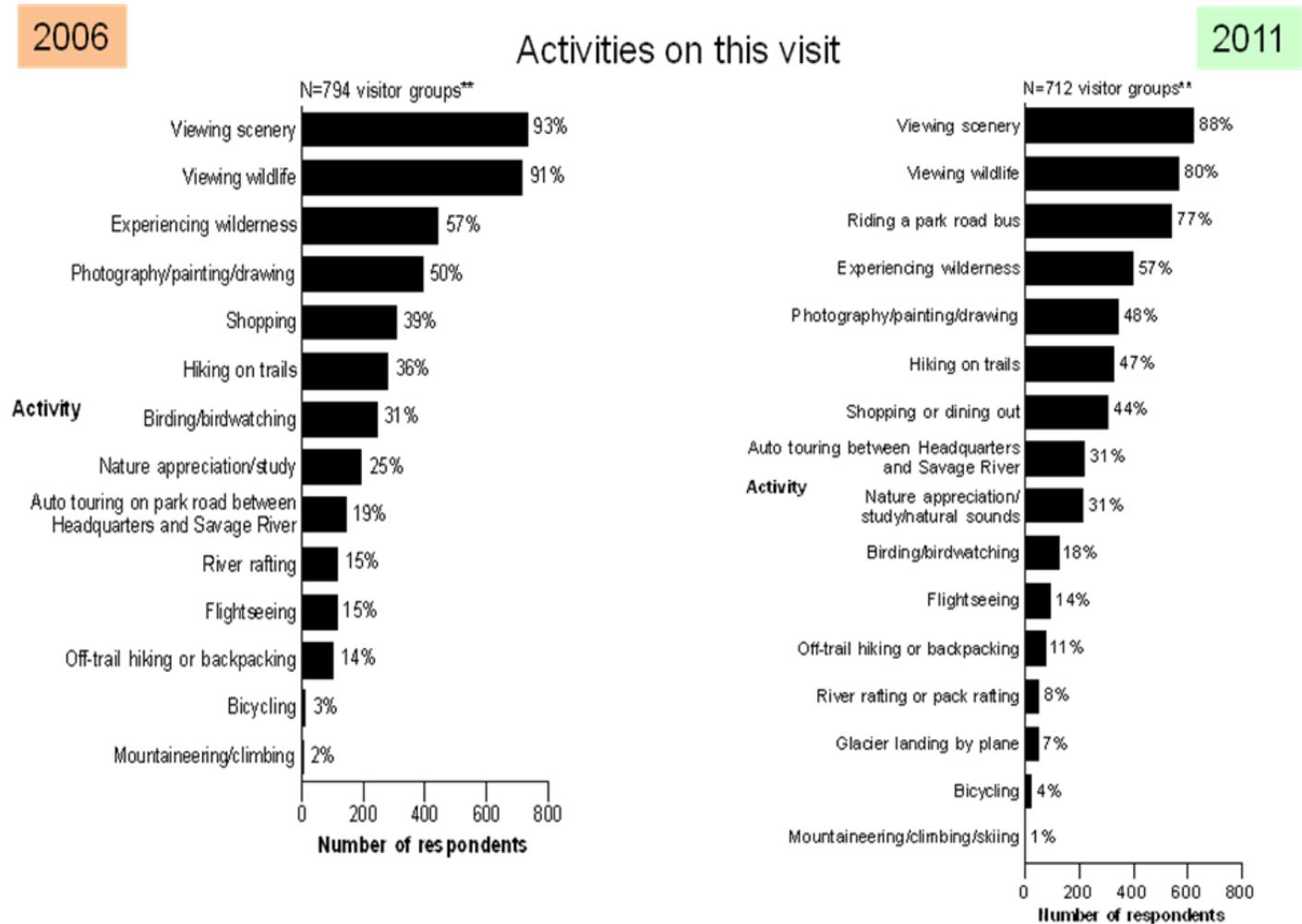
#### B. Total Winter Visitation

<b>Month</b>	<b>Winter 2010-2011</b>	<b>Winter 2011-2012</b>	<b>Average for these two seasons</b>
October	764	954	859
November	173	273	223
December	232	260	246
January	247	263	255
February	701	654	448
March	1142	1921	1532
<b>TOTAL</b>	<b>3259</b>	<b>4325</b>	<b>3563</b>

A trail counter was in place at the headquarters gate during the months of November 2009, December 2009, and January 2010. The data shows that an average of 4.69 people a day used the Park Road for recreational or work purposes during these months. Nearly 80 percent of this use occurred mid-week and the noon hour was the most popular time of day which may indicate that park employees are the main users of the road during winter. The short daylight hours and warmer midday temperatures may contribute to this midday peak. (NPS statistics)

Data collected from summer visitors during 2006 and 2011 is displayed in the Figure below. This data indicates that the number one activity of visitors in the park is viewing the scenery. Viewing wildlife was the second most popular activity.

**Figure 3 – Visitor Activities**



From Denali National Park & Preserve 2006 & 2011 Visitor Studies

Wilderness Character

The Wilderness Act of 1964 (P.L. 88-577) describes wilderness as an area “untrammeled by man...retaining its primeval character and influence, without permanent improvements or human

habitation [with] outstanding opportunities for solitude or a primitive and unconfined type of recreation.”

The Wilderness Act Section 2(c): “A wilderness, in contrast with those areas where man and his own works dominate the landscape, is hereby recognized as an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain. An area of wilderness is further defined to mean in this Act an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value.”

Most of the land within the boundaries of Denali National Park and Preserve meets the above criteria, offering superlative opportunities for wilderness recreation in an environment where human influences are minimal.

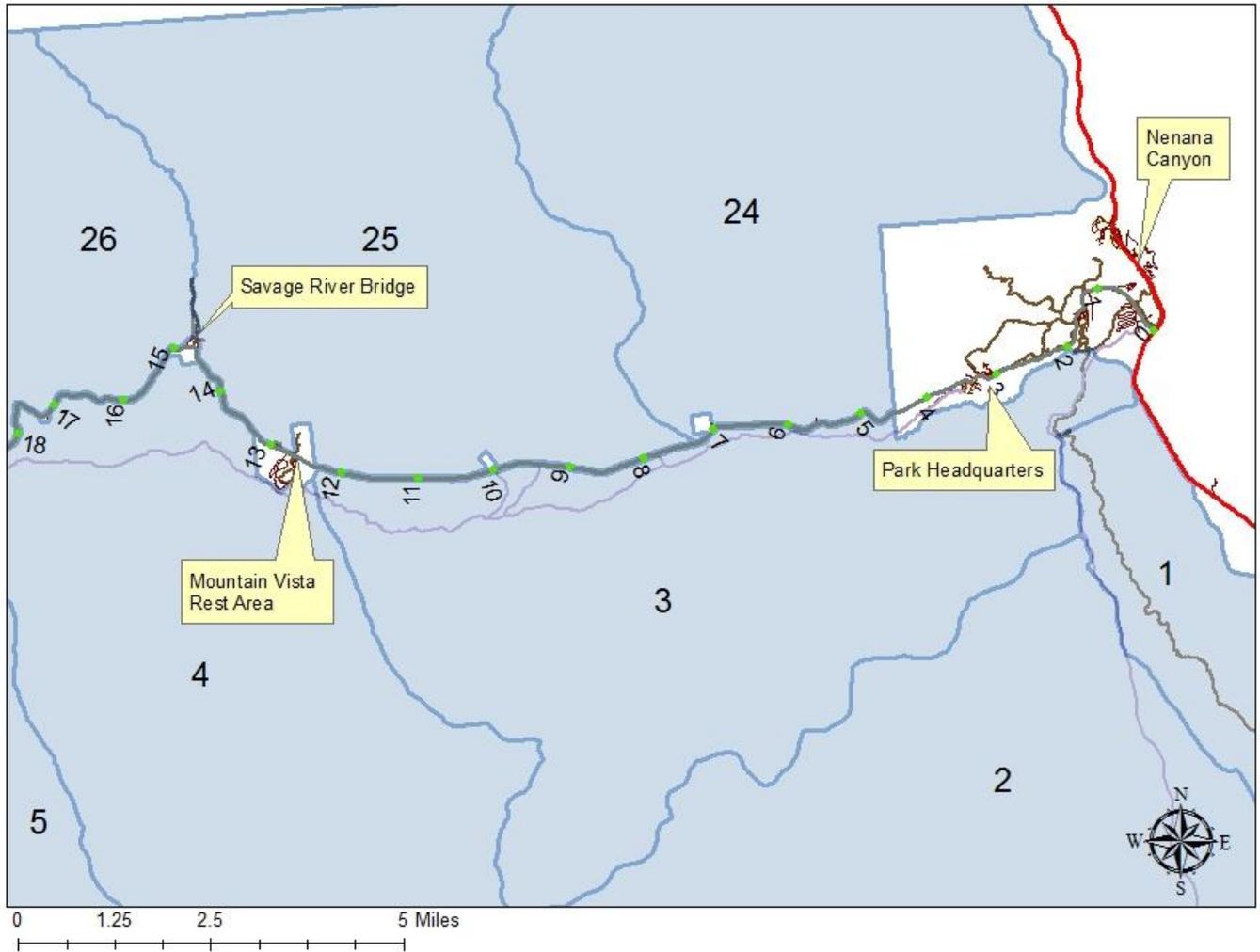
However, the association of Denali with wilderness began before the advent of the Wilderness Act, and before the passage of the 1980 Alaska National Interest Lands Conservation Act, which formally designated 99% of the former Mt. McKinley National Park as wilderness. Aside from wider exclusions at campgrounds, administration areas and projected gravel borrow areas, the wilderness boundary generally is set at 150 feet either side of the centerline of the Park Road. In fact, the recognition and protection of Denali’s wilderness resource values stretches back to the earliest period of the park’s history, creating a lengthy legacy of wilderness management (NPS 2006).

Backcountry units 3, 4, 24, 25, and 26 are adjacent or near the project area. Table 4 shows backcountry use between October 2011 and February 2012.

**Table 5 – Winter Backcountry Users from October 2011 and February 2012**

<b>Location</b>	<b>Users Traveling Through Unit</b>	<b>Users Camping in Unit</b>	<b>Total User Days</b>
Unit 3	10	5	15
Unit 4	5	1	6
Unit 24	15	4	19
Unit 25	15	0	15
Unit 26	5	3	8
<b>Totals</b>	50	13	63

**Figure 4 – Backcountry Units Adjacent to Project Area** (note blue shading shows wilderness however, the map scale does not allow the 150' buffer from centerline of the road to be visible)



Soundscape

NPS Management Policies define natural soundscapes as follows:

Natural soundscapes exist in the absence of human-caused sound. The natural soundscape is the aggregate of all the natural sounds that occur in parks, together with the physical capacity for transmitting natural sounds. Natural sounds occur within and beyond the range of sounds that humans can perceive, and can be transmitted through air, water, or solid materials.

The existing acoustic environment of Denali National Park and Preserve consists of both natural ambient sounds and human-induced noises such as those associated with motorized vehicles. Directors Order #47 states “noise is generally defined as an unwanted or undesired sound, often unpleasant in quality, intensity or repetition.”

The 2006 BCMP states “The Park Road would be maintained to mile 7 during winter months for administrative purposes only to remove ice from the Park Road, although a snow-covered surface would remain for winter recreation. This action would result in heavy road equipment traveling up four miles of the Park Road beyond park headquarters between October and March. Experimentation has proved that the required maintenance can generally be accomplished before 10am and is required only occasionally. Natural sound disturbance would be minimal and would likely fit within the range allowable for a Low standard of natural sound disturbance.

To understand the current deep-winter acoustic conditions along the road corridor without vehicle traffic, an automated sound monitoring station was deployed along Hines Creek (see Appendix D). The sampling site was located in designated wilderness, at 63.71061°, -149.07915°, approximately one quarter-mile from the Park Road. At this location, an ANSI Type 1 certified Sound Level Meter collected one-second spectral sound pressure level data during the period from 02/12/2012 to 02/21/2012. Unless otherwise noted, these data are used for all subsequent analyses.

**Table 6 - Expected audible distances of vehicles** (see Appendix D for calculation procedure)

Sound Power Level ( $L_w$ ) :	90 dB	95 dB	100 dB	105 dB
Which vehicles?	some quiet autos	most autos, some vans, trucks	loud autos, vans, trucks, some buses and maintenance equipment	most buses and maintenance equipment
<b>Audible Distance</b>	<b><i>1.9 - 2.2 miles</i></b>	<b><i>3.2 - 3.7 miles</i></b>	<b><i>5.2 - 5.8 miles</i></b>	<b><i>7.7 - 8.4 miles</i></b>

The winter soundscape is considerably quieter than the summer soundscape. Sounds generated by vehicles in the winter may be more noticeable and travel further.

### Socioeconomics

The rural communities in the Denali Borough and northern Matanuska-Susitna Borough are most affected by Denali National Park because they are very near the park, their economies are much smaller and less diverse than the Fairbanks North-Star Borough or the Municipality of Anchorage, and a significant portion of their economy is already linked to park-oriented tourism.

The Denali Borough’s economy is comprised of several key employers that combine to create a fairly stable and diverse foundation, coupled with travel and tourism activity driven by the strong seasonal influence of the park. The key employers responsible for the stable economic base include the Usibelli Coal Mine, Golden Valley Electrical Association, the Clear Air Force Station, the National Park Service, and state and local government and public education agencies.

Superimposed on the year-round employment is a strong seasonal employment effect created by park operations, including concession activities in the park and the myriad of activities associated with visitor services outside the park. Within the park, the Park Service maintains

approximately 125 permanent and term positions, adding approximately another 250 seasonal and temporary jobs during the summer visitor season (May through September). The Kantishna Roadhouse, Denali Backcountry Lodge, and jointly owned and operated Camp Denali and North Face lodges are on private inholdings approximately 90 miles from the Denali Visitor Center. These facilities operate seasonally and collectively employ approximately 150 people. In addition, concession operations employ up to 300 individuals to operate the park's bus transit system (including the Wilderness Access Center), in-park food service, and Riley Creek and Savage River campgrounds. Alaska Geographic, an official partner of the national parks in Alaska, staffs and operates retail outlets selling books, educational materials, pictures, and other miscellaneous merchandise at the Denali Visitor Center campus and the Toklat River contact station / rest area (mile 53 of the Park Road).

Business establishments catering to the market demands associated with park visitors, temporary employees, and to a lesser extent, needs associated with commercial and leisure traffic along the George Parks Highway, create a similar, even more pronounced seasonal economic expansion outside the park, particularly in the "gateway" area. The hospitality and retail establishments in the gateway include six major corporate-owned lodges or hotels; several smaller motels, bed and breakfasts, RV parks, and rental cabin operations; numerous restaurants, coffee shops, and fast food outlets; and miscellaneous apparel, souvenir, and convenience stores. A variety of recreation outfitters, guides, and service establishments are also in the area, offering guided fishing, hiking, rafting, jeep tours, motorcycle and trail bike rentals, horseback riding, and other outdoor activities.

Scenic air tour and air taxi operators flying from airstrips and airports in and near the park offer visitors a unique Denali experience, providing opportunities for "flightseeing" tours over the park and around Mount McKinley, glacier landings, access to the Kantishna area, and mountain climbing and backcountry camping. Air tour and air taxi flights in the northern area operate from the McKinley Park airstrip in the park and airstrips near Kantishna, Healy, and McKinley Village.

Transportation is yet another dimension of the seasonal economy workforce. Although independent travelers represent an estimated 45% of all visitors to the park, 55% arrive as part of package tour, typically involving a cruise as part of the larger itinerary. Travel from the port to the park is via a scenic rail journey on the Alaska Railroad, motor coach tour, or rental vehicle, creating yet additional seasonal jobs. Although most of the employees affiliated with these jobs are based elsewhere, they contribute to the seasonal expansion of employment in the region.

The net result of the seasonal visitation to the park, increase in park staffing, and tourism and other traffic on the George Parks Highway is a dramatic and pronounced 250% to 300% increase in employment in Denali Borough during June, July, and August. There was also a sharp year-to-year decline of approximately 750 jobs between 2008 and 2009 that occurred in conjunction with a decline in total recreation visitor use at the park.

A corollary to the seasonal spike in employment is a seasonal decline in unemployment among residents. In fact, anecdotal information suggests that a number of residents work full-time

during the tourism season as their primary means of economic support, saving a portion of their earnings and then seeking part-time work or choosing to not work the remainder of the year.

More than 75% of the seasonal employment gains are concentrated in the overnight accommodations and food service industries, with those gains further concentrated in the large hotels and motels in Nenana Canyon and McKinley Village that collectively serve the visitors to Denali.

### Cultural Resources

Denali National Park and Preserve is an important area to both the history and prehistory of Alaska. To date over 260 prehistoric and historic sites have been documented in the park, many of which are found along the Park Road Corridor. The Park Road (HEA-00429/ MMK-00171) is itself a historic property and is listed on the National Register of Historic Places.

The area of potential effect (APE) has been previously inventoried (Davis 1983), additional survey was conducted of the proposed trail reroute. The APE includes the Park Road from mile 3.4 to mile 12 (381 acres), and the section of reroute on the spring trail (2 acres) located 0.75 miles due south of the park road at mile post 4.1.

The potential reroute of the Spring Trail was surveyed, and no new historic properties were identified. The potential for subsurface cultural remains is very low. The Park Road (HEA-00429/ MMK-00171) is located in the APE of this project. No other historic properties are located within the APE. There are several archaeological sites that are located near the APE along the park road. While there may be an increase in the number of visitors to the project area during the winter months as a result of this project, the sites located near the project area will not be impacted by this increase as it will be a fraction of the number of visitors that the area sees during the summer months.

Only one historic property, the Denali Park Road (HEA-429/ MMK-171), was identified within the APE for the proposed undertaking. The park road will not be affected by this project, as no changes will be made to the road. It may be appropriate for ground disturbing activities to be monitored by cultural resource staff. As designed, the project will not affect historic properties, and it is recommended that DENA approach National Historic Preservation Act, Section 106, consultation under 36 CFR Part 800.5(3)(b) as “No Historic Properties Affected”.

### Vegetation, Wetlands & Soils

The proposed changes to the Spring Trail would be set in an open to closed white spruce forest with localized small stands of black spruce (*Picea mariana*). Tall shrubs, such as feltleaf willow (*Salix alaxensis*) and bebb willow (*Salix Bebbiana*) are found on drier sites and diamond-leaf willow (*Salix planifolia*), Richardson willow (*Salix lanata*), and Barclay willow (*Salix barclayi*) are common alongside the drainages or in areas of springs. Shorter shrubs such as blueberry (*Vaccinium uliginosum*), labrador tea (*Ledum groenlandicum*), rose (*Rosa acicularis*), and tundra rose (*Potentilla fruticosa*) are also common.

Palustrine scrub shrub wetlands are found bordering the drainages and below springs or seeps.

## IV. ENVIRONMENTAL CONSEQUENCES OF THE ALTERNATIVES

### Assumptions for Impact Analysis

This section contains an evaluation of the direct and indirect environmental impacts of two action alternatives and the no action alternative. The analysis assumes that the mitigation identified in the *Mitigation and Monitoring* section of this environmental assessment would be implemented.

Cumulative impacts of projects that have been completed near the study area were analyzed to determine if the incremental impacts to the environment are unacceptable.

### Methodology

#### Impact Criteria and Assessment

The impact analysis was conducted in a consistent manner based on standardized impact definitions. For each issue selected for detailed analysis direct, indirect, and cumulative impacts have been described. Impacts identified for each issue are based on the duration, extent, and intensity of the impact. Summary impact levels (characterized as negligible, minor, moderate, or major) are given for each impact topic. Impact level thresholds are defined in the table below.

**Table 7 – Summary Impacts of the Alternatives**

Impact Level	Negligible	Minor	Moderate	Major
<b>Intensity</b>	Little or no impact to the resource would occur; any change that might occur may be perceptible but difficult to measure	Change in a resource would occur, but no substantial resource impact would result; The change would be perceptible but would not alter the condition of the resource.	Noticeable change in a resource would occur and this change would alter the condition or appearance of the resource, but the integrity of the resource would remain.	Substantial impact or change in a resource area would occur that is easily defined, highly noticeable, and measurably alters the integrity or appearance of the resource.
<b>Extent</b>	None	Localized – Impact would occur only at site or immediate surroundings.	Wide Area of Park – Impact would affect the resource on a regional level or in the park as a whole.	Park-wide – Impact would affect the resource on a regional level.
<b>Duration</b>	None	Temporary – Impact would occur only for a short time and resource conditions would return to original conditions.	Short-term – Impact would extend beyond winter season but would not last more than two years.	Long-term – Impact would likely last more than two years.

## **Alternative 1 – No Action. No plowing past park headquarters (mile 3)**

### Visitor Experience & Opportunity

Current winter recreation opportunities in Denali require visitors to be ready for extreme conditions and utilize outdoor gear such as skis, snowshoes, or dogsleds. There are limited opportunities for visitors who are not able or prepared to have an outdoor recreational experience. Alternative 1 would not provide any new opportunities for winter visitors to Denali. However, existing opportunities would remain for outdoor recreational users of the Park Road. These may include but are not limited to skiing, skijoring, and dog mushing. Winter mountain viewing would continue outside the park from the Parks Highway viewpoints and from inside the park for backcountry users.

**Cumulative Effects:** The addition of the Murie Science and Learning Center, guided snowshoe hikes, Winterfest activities, and winter camping in Riley Creek Campground have contributed to an overall moderate beneficial long-term impact to visitor experience and opportunity. This alternative would not change the overall existing condition.

**Conclusion:** Alternative A would not change impacts to visitor experience or opportunity.

### Wilderness Character

Under this alternative, indicators of human presence and human generated noises would remain the same. Wilderness character would not change.

**Cumulative Effects:** The actions approved in the BCMP have negligible overall impacts on wilderness resources in the Denali backcountry, protecting and improving conditions in some areas while allowing the loss of some quality in others. Other projects that have minor adverse long-term impacts to area wilderness character include brushing the Spring Trail, the addition of the Savage Alpine Trail, and maintenance of aufeis during winter months. This alternative would not change overall cumulative effects which remain minor, adverse, and long-term.

**Conclusion:** Alternative 1 would result in no changes to wilderness character.

### Soundscapes

Under this alternative the human generated noises would remain the same. Soundscapes would not be affected.

**Cumulative Effects:** The actions approved in the BCMP had negligible overall impacts on the natural sound environment of the Denali backcountry. Backcountry users in winter months may experience overflights by commercial air traffic, military planes, and NPS administrative flights. Noise from maintenance vehicles may also be audible in morning hours due to aufeis removal. This alternative would not contribute to cumulative effects which are currently minor, adverse, and long-term.

**Conclusion:** Alternative 1 would have no impact on human generated noises.

### Socioeconomics

Alternative 1 would have no impact on socioeconomics either locally or regionally. No new business opportunities would be created.

Cumulative Effects: The BCMP predicted minor, beneficial long-term impacts would be anticipated for area businesses. Additional beneficial impacts have occurred due to Winterfest activities, guided snowshoe hikes, and the addition of the Murie Science and Learning Center. This alternative would not change the overall cumulative effects.

Conclusion: Alternative 1 would result in no impacts.

### Cultural Resources

Alternative 1 would not result in new construction or change of use.

Cumulative Effects: Projects which have affected the Park Road or had previous ground disturbance in this area include construction of the Mountain Vista Rest Area and trails near the historic Savage Camp. The Savage Alpine trail, Savage River loop, and Spring Trail have also had the potential to affect historic resources although no archeological resources have been found along the Spring Trail route. Road work around mile 4 has also occurred. No disturbance to the mineral soil is anticipated from this alternative and no impacts to historic or archeological resources are expected. Cumulative Effects would remain minor, adverse, and long-term.

Conclusion: Alternative 1 would have no potential to affect cultural resources.

### Vegetation, Wetlands, & Soils

Alternative 1 would have no impact on vegetation, wetlands, & soils since no construction or change of use would occur.

Cumulative Effects: Projects which have had previous vegetation, wetland, or soil disturbance in this area include construction of the Mountain Vista Rest Area and trails near the historic Savage Camp. The Savage Alpine trail, Savage River loop, Spring Trail, and road work at mile 4.5 have also disturbed these resources. The vegetation removal due to previous projects did not have a significant cumulative impact on the tens of thousands of acres of taiga or other vegetation resources at the park entrance area. This project would not contribute to these existing minor adverse long-term impacts.

Conclusion: Alternative 1 would have no potential to affect vegetation, wetlands, or soils.

## **Alternative 2 – Plow road for full winter season and allow additional improvements to the Spring Trail**

### Visitor Experience & Opportunity

Alternative 2 would provide new sightseeing opportunities for visitors arriving by private and commercial vehicles. However, winter visitors who would be displaced from this section of the road may be negatively impacted. Most of the winter visitors who use the road for recreational purposes do so during the week around the noon hour. Additional recreation opportunities would be created by grooming the Riley Creek Campground Loop and by providing access farther into the park for recreational users who may prefer to begin their activity at mile 12. Additional mountain viewing opportunities would be provided inside the park for visitors traveling by private or commercial vehicles to Mountain Vista Rest Area.

**Cumulative Effects:** The addition of the Murie Science and Learning Center, guided snowshoe hikes, Winterfest activities, and winter camping in Riley Creek Campground have contributed to an overall moderate beneficial long-term impacts to visitor experience and opportunity. This alternative will further benefit visitor experience and opportunity; however, cumulative effects would remain moderate, beneficial, and long-term.

**Conclusion:** Altogether the impacts would be moderate, long-term, and beneficial since the majority of non-employee winter visitors would benefit from the additional opportunities for sightseeing and vehicular access.

### Wilderness Character

The Park Road would be plowed to Mountain Vista Rest Area during winter months and a warming hut and emergency communications device may be provided. The direct action would not affect designated wilderness; however, indirectly this action could result in additional activity visible from the surrounding wilderness area compared to existing condition. However, management area standards would keep these impacts on wilderness resources at a level no greater than what presently occurs in the same area during summer months.

Backcountry users in units 3, 4, 24, 25, and 26 may be affected by this project. Some users utilize the Park Road to access (using skis, snowshoes, or dogs) a backcountry unit a few may only camp in these units and access them by a route other than the Park Road. Visitors in these units may be negatively impacted due to the increased noise of vehicles on the road; however, this may be mitigated by the opportunity to begin their activities farther in the park.

**Cumulative Effects:** The actions approved in the BCMP have negligible overall impacts on wilderness resources in the Denali backcountry, protecting and improving conditions in some areas while allowing the loss of some quality in others. Other projects that have minor adverse long-term impacts to wilderness character include brushing the Spring Trail, the addition of the Savage Alpine Trail, and maintenance of aufeis during winter months. This alternative would contribute to the overall cumulative impacts which would become moderate, adverse, and long-term.

Conclusion: Alternative 2 would result in moderate, long-term, adverse impacts to wilderness character since it would allow for an increase the amount of human activity visible and audible from the surrounding wilderness and result in further development of the Spring Trail.

### Soundscapes

This alternative would introduce additional noise from commercial use, private vehicles, plowing, maintenance, and ranger patrols would occur on the Park Road for the winter season. Adding traffic to the road corridor would proportionally increase the amount of time that motorized noise would be audible as well as fragment the longest naturally quiet intervals of the year into far shorter portions of time.

Cumulative Effects: The actions approved in the BCMP had negligible overall impacts on the natural sound environment of the Denali backcountry. Backcountry users in winter months may experience overflights by commercial air traffic, military planes, and NPS administrative flights. Noise from maintenance vehicles may also be audible in morning hours due to aufeis removal. This alternative would contribute to cumulative impacts to the winter soundscape; however, the impacts would be moderate, adverse, and long-term.

Conclusion: Alternative 2 may result in moderate, long-term, adverse impacts to the winter soundscape by allowing vehicle noise along this section of the park road for an additional six months each year.

### Socioeconomics

Alternative 2 could result in moderate increases in income for many existing businesses. There would be opportunities for starting new businesses as a result of anticipated growth in recreational use levels in the park. These changes could also lead to increased employment opportunities and income levels, commensurate with the levels of increased recreational use for recreation-oriented businesses near Denali National Park and Preserve.

Cumulative Effects: Beneficial impacts have occurred due to Winterfest activities, guided snowshoe hikes, and the addition of the Murie Science and Learning Center. The potential increase in recreational uses from this project would be a moderate contributor to increases in overall economic activity, development, and employment in the Denali region. As a result, there would be benefits from increased tourism and economic activity in winter months and cumulative impacts would be moderate, beneficial, and long-term.

Conclusion: Alternative 2 may result in moderate, long-term, beneficial impacts due to the increase in visitors to Denali National Park & Preserve in winter months.

### Cultural Resources

No cultural resources are anticipated to be found along the trail route since surveys on the Spring Trail have not yielded any. If cultural resources are uncovered during the work on the Spring Trail, work would cease and appropriate mitigation would be undertaken prior to resumption (see mitigation measures on page 16).

Cumulative Effects: Projects which have affected the Park Road or had previous ground disturbance in this area include construction of the Mountain Vista Rest Area and trails near the historic Savage Camp. The Savage Alpine trail, Savage River loop, and Spring Trail have also had the potential to affect historic and archeological resources although none have been found along the Spring Trail route. Minimal ground disturbance is anticipated from the project and no impacts to historic or archeological resources are expected. Existing impacts are considered minor, adverse, and long-term however, this alternative would not contribute to these.

Conclusion: Alternative 2 is unlikely to affect cultural resources. Impacts to cultural resources are considered to be negligible and the State Historic Preservation Office has provided a determination of 'No Historic Properties Affected'.

#### Vegetation, Wetlands, & Soils

Alternative 2 would allow up to 1000 foot of the Spring Trail to be rerouted of the Spring Trail and relocation of several boulders in the trail.

Cumulative Effects: Projects which have had previous vegetation, wetland, or soil disturbance in this area include construction of the Park Road, construction of the Mountain Vista Rest Area and trails near the historic Savage Camp. The Savage Alpine trail, Savage River loop, Spring Trail, and road work at mile 4.5 have also disturbed these resources. The vegetation removal due to previous projects did not have a significant cumulative impact on the tens of thousands of acres of taiga or other vegetation resources at the park entrance area. This project will not contribute to these existing impacts which are considered moderate, adverse, and long-term.

Conclusion: Alternative 2 may result in minor, long-term, adverse impacts to vegetation, wetlands, and soils by rerouting up to 1000 feet of the Spring Trail.

### **Alternative 3 – Plow road for partial winter season beginning mid-January and minor changes to the Spring Trail**

#### Visitor Experience & Opportunity

Alternative 3 would provide new sightseeing opportunities for visitors arriving by private and commercial vehicles during some winter months. Winter visitors who would be displaced from this section of the road would be negatively impacted to a lesser degree than under alternative 2, because the primary value of using the park road for skiing and dog mushing would be in the early winter months – October-January – when snow accumulation on other trails is less dependable. Additional outdoor recreation opportunities would be created by providing access further into the park for those who prefer to begin their activity at mile 12. Additional mountain viewing opportunities would be provided inside the park for visitors traveling by private or commercial vehicles to Mountain Vista Rest Area during part of the winter season.

Cumulative Effects: The addition of the Murie Science and Learning Center, guided snowshoe hikes, Winterfest activities, and winter camping in Riley Creek Campground have contributed to

an overall moderate beneficial long-term impacts to visitor experience and opportunity. This alternative would further benefit the existing condition.

Conclusion: Alternative 3 would have minor, long-term, beneficial impacts on visitor experience and opportunity since winter visitor options would be increased and displacement of recreational users would be minimized.

### Wilderness Character

The Park Road would be plowed to Mountain Vista Rest Area from January to March and an emergency communications device may be provided. The direct action would not affect designated wilderness; however, indirectly this action could result in additional activity visible from the surrounding wilderness area compared to existing condition. However, management area standards would keep these impacts on wilderness resources at a level no greater than what presently occurs in the same area during summer months.

Backcountry users in units 3, 4, 24, 25, and 26 may be affected by this project. Some users utilize the Park Road to access (using skis, snowshoes, or dogs) a backcountry unit while a few may only camp in these units and access them by a route other than the road. Visitors in these units may be negatively impacted due to the increased noise of vehicles on the road; however, this may be mitigated by the opportunity to begin their activities farther in the park.

Cumulative Effects: The actions approved in the BCMP have negligible overall impacts on wilderness resources in the Denali backcountry, protecting and improving conditions in some areas while allowing the loss of some quality in others. Other projects that have minor adverse long-term impacts to wilderness character include brushing the Spring Trail, the addition of the Savage Alpine Trail, and maintenance of aufeis during winter months. This alternative would not contribute to the overall cumulative impacts which are minor, adverse, and long-term.

Conclusion: Alternative 3 would result in minor, long-term, adverse impacts to wilderness character since it would increase the amount of human activity visible from the surrounding wilderness for two-three months longer than currently seen.

### Soundscapes

This alternative would introduce additional noise from commercial use, private vehicles, plowing, maintenance, and ranger patrols would occur on the Park Road for part of the winter season. Adding traffic to the road corridor would proportionally increase the amount of time that motorized noise would be audible as well as fragment the longest naturally quiet intervals of the year into shorter portions of time.

Cumulative Effects: The actions approved in the BCMP had negligible overall impacts on the natural sound environment of the Denali backcountry. Backcountry users in winter months may experience overflights by commercial air traffic, military planes, and NPS administrative flights. Noise from maintenance vehicles may also be audible in morning hours due to aufeis removal.

This alternative would contribute to cumulative impacts to the winter soundscape which are considered minor, adverse, and long-term.

Conclusion: Alternative 3 may result in minor, long-term, adverse impacts to the winter soundscape since additional vehicular and human generated noises would be audible for two-three additional months of the year.

### Socioeconomics

Alternative 3 could result in moderate increases in income for many existing businesses. There would be opportunities for starting new businesses as a result of anticipated growth in recreational use levels in the park. These changes could also lead to increased employment opportunities and income levels, commensurate with the levels of increased recreational use for recreation-oriented businesses near Denali National Park and Preserve.

Cumulative Effects: Beneficial impacts have occurred due to Winterfest activities, guided snowshoe hikes, and the addition of the Murie Science and Learning Center. The potential increase in recreational uses from this project would be a moderate contributor to increases in overall economic activity, development, and employment in the Denali region. As a result, this alternative would contribute to the overall minor beneficial long-term impacts from increased tourism and economic activity in winter months.

Conclusion: Alternative 3 may result in minor, long-term, beneficial impacts due to the increase in visitors to Denali National Park & Preserve during late winter months when warmer and longer days facilitate outdoor recreation.

### Cultural Resources

No cultural resources are anticipated to be found along the trail route since none have been found in surveys of the Spring Trail. If cultural resources are uncovered during the work on the Spring Trail, work would cease and appropriate mitigation would be undertaken prior to resumption (see Mitigation Measures on page 16).

Cumulative Effects: Projects which have previously affected the park road or have had ground disturbance in this area include construction of the Mountain Vista Rest Area and trails near the historic Savage Camp. The Savage Alpine trail, Savage River loop, and Spring Trail have also had the potential to affect historic or cultural resources although no resources have been found along the Spring Trail route. Minimal ground disturbance is anticipated from the project and no impacts to historic or archeological resources are expected. Existing impacts are considered minor, adverse, and long-term however, this alternative would not contribute to these.

Conclusion: Alternative 3 is unlikely to affect cultural resources. Impacts to cultural resources are considered to be negligible and the State Historic Preservation Office has provided a determination of 'No Historic Properties Affected'.

### Vegetation, Wetlands, & Soils

Alternative 3 would allow the relocation of several boulders in the Spring Trail at creek crossings.

Cumulative Effects: Projects which have had previous vegetation, wetland, or soil disturbance in this area include construction of the Mountain Vista Rest Area and trails near the historic Savage Camp. The Savage Alpine trail, Savage River loop, Spring Trail, and road work at mile 4.5 have also disturbed these resources. The vegetation removal due to previous projects did not have a significant cumulative impact on the tens of thousands of acres of taiga or other vegetation resources at the park entrance area. This project will not contribute these existing impacts which are considered minor, adverse, and long-term.

Conclusion: Alternative 3 is will result in negligible impacts to vegetation, wetlands, and soils from the relocation of several boulders that make creek crossings difficult in winter.

### **Alternative 4 (NPS Preferred) – Plow road for on a trial basis for 3-5 years beginning mid-February**

#### Visitor Experience & Opportunity

Alternative 4 would provide new sightseeing opportunities for visitors arriving by private and commercial vehicles during some winter months. Winter visitors who would be displaced from this section of the road would be negatively impacted to a lesser degree than under alternatives 2 and 3, because the primary value of using the park road for skiing and dog mushing would be in the early winter months – October-January – when snow accumulation on other trails is less dependable. Additional outdoor recreation opportunities would be created by providing access further into the park for those who prefer to begin their activity at mile 12. Additional mountain viewing opportunities would be provided inside the park for visitors traveling by private or commercial vehicles to Mountain Vista Rest Area during part of the winter season.

Cumulative Effects: The addition of the Murie Science and Learning Center, guided snowshoe hikes, Winterfest activities, and winter camping in Riley Creek Campground have contributed to an overall moderate beneficial long-term impacts to visitor experience and opportunity. This alternative would further benefit the existing condition.

Conclusion: Alternative 3 would have minor, long-term, beneficial impacts on visitor experience and opportunity since winter visitor options would be increased and displacement of recreational users would be minimized.

#### Wilderness Character

The Park Road would be plowed to Mountain Vista Rest Area from February to March. The direct action would not affect designated wilderness; however, indirectly this action could result in additional activity visible from the surrounding wilderness area compared to existing condition. However, management area standards would keep these impacts on wilderness resources at a level no greater than what presently occurs in the same area during summer months.

Backcountry users in units 3, 4, 24, 25, and 26 may be affected by this project. Some users utilize the Park Road to access (using skis, snowshoes, or dogs) a backcountry unit while a few may only camp in these units and access them by a route other than the road. Visitors in these units may be negatively impacted due to the increased noise of vehicles on the road; however, this may be mitigated by the opportunity to begin their activities farther in the park.

**Cumulative Effects:** The actions approved in the BCMP have negligible overall impacts on wilderness resources in the Denali backcountry, protecting and improving conditions in some areas while allowing the loss of some quality in others. Other projects that have minor adverse long-term impacts to wilderness character include brushing the Spring Trail, the addition of the Savage Alpine Trail, and maintenance of aufeis during winter months. This alternative would not contribute to the overall cumulative impacts which are minor, adverse, and long-term.

**Conclusion:** Alternative 4 would result in minor, long-term, adverse impacts to wilderness character since it would increase the amount of human activity visible from the surrounding wilderness for one to two months longer than currently seen.

### Soundscapes

This alternative would introduce additional noise from commercial use, private vehicles, plowing, maintenance, and ranger patrols would occur on the Park Road four weeks earlier than they are now. Adding traffic to the road corridor would proportionally increase the amount of time that motorized noise would be audible as well as fragment the longest naturally quiet intervals of the year into shorter portions of time.

**Cumulative Effects:** The actions approved in the BCMP had negligible overall impacts on the natural sound environment of the Denali backcountry. Backcountry users in winter months may experience overflights by commercial air traffic, military planes, and NPS administrative flights. Noise from maintenance vehicles may also be audible in morning hours due to aufeis removal. This alternative would contribute to cumulative impacts to the winter soundscape which are considered minor, adverse, and long-term.

**Conclusion:** Alternative 4 may result in minor, long-term, adverse impacts to the winter soundscape since additional vehicular and human generated noises would be audible for one to two additional months of the year.

### Socioeconomics

Alternative 4 could result in minor increases in income for many existing businesses. There would be opportunities for starting new businesses as a result of anticipated growth in recreational use levels in the park. These changes could also lead to increased employment opportunities and income levels, commensurate with the levels of increased recreational use for recreation-oriented businesses near Denali National Park and Preserve.

Cumulative Effects: Beneficial impacts have occurred due to Winterfest activities, guided snowshoe hikes, and the addition of the Murie Science and Learning Center. The potential increase in recreational uses from this project would be a moderate contributor to increases in overall economic activity, development, and employment in the Denali region. As a result, this alternative would contribute to the overall minor beneficial long-term impacts from increased tourism and economic activity in winter months.

Conclusion: Alternative 4 may result in minor, long-term, beneficial impacts due to the increase in visitors to Denali National Park & Preserve during late winter months when warmer and longer days facilitate outdoor recreation.

### Cultural Resources

Alternative 4 would have no ground disturbance and would not impact cultural resources.

Cumulative Effects: Projects which have previously affected the park road or have had ground disturbance in this area include construction of the Mountain Vista Rest Area and trails near the historic Savage Camp. The Savage Alpine trail, Savage River loop, and Spring Trail have also had the potential to affect historic or cultural resources although no resources have been found along the Spring Trail route. Existing impacts are considered minor, adverse, and long-term however, this alternative would not contribute to these.

Conclusion: Alternative 4 will not affect cultural resources.

### Vegetation, Wetlands, & Soils

Alternative 4 would have no ground disturbance and would not impact vegetation, wetlands, or soils.

Cumulative Effects: Projects which have had previous vegetation, wetland, or soil disturbance in this area include construction of the Mountain Vista Rest Area and trails near the historic Savage Camp. The Savage Alpine trail, Savage River loop, Spring Trail, and road work at mile 4.5 have also disturbed these resources. The vegetation removal due to previous projects did not have a significant cumulative impact on the tens of thousands of acres of taiga or other vegetation resources at the park entrance area. This project will not contribute these existing impacts which are considered minor, adverse, and long-term.

Conclusion: Alternative 4 will not affect vegetation, wetlands, or soils.

## **V. CONSULTATION AND COORDINATION**

### **List of Persons and Agencies Consulted:**

Dan Abbe, Backcountry District Ranger, Denali National Park and Preserve  
Andrew Ackerman, Social Scientist, Denali National Park and Preserve  
Rob Burrows, Wilderness Resources Specialist, Denali National Park and Preserve  
Davyd Betchkal, Physical Science Technician, Denali National Park and Preserve  
Steve Carwile, Compliance Officer, Denali National Park and Preserve

### **List of Preparers:**

Paula Homan, Environmental Protection Specialist, Denali National Park and Preserve

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**National Park Service Director's Orders** referenced in this document are available online at [www.nps.gov/applications/npspolicy/DOrders.cfm](http://www.nps.gov/applications/npspolicy/DOrders.cfm)

## **APPENDIX A**

### **SUBSISTENCE - SECTION 810(a) OF ANILCA SUMMARY EVALUATION AND FINDINGS**

#### **I. INTRODUCTION**

This section was prepared to comply with Title VIII, Section 810 of the Alaska National Interest Lands Conservation Act (ANILCA). It summarizes the evaluation of potential restrictions to subsistence that could result from the Denali National Park Winter Road Plowing Project.

#### **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 will involve the minimal amount of public lands necessary to accomplish the purposes of such use, occupancy, or other disposition, and (C) reasonable steps will 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 was created by ANILCA Section 202(3)(a):

"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."

Title I of ANILCA established national parks for the following purposes:

". . . to preserve unrivaled scenic and geological values associated with natural landscapes; to provide for the maintenance of sound populations of, and habitat for, wildlife species of inestimable value to the citizens of Alaska and the Nation, including those species dependent on vast relatively undeveloped areas; to preserve in their natural state extensive unaltered arctic tundra, boreal forest, and coastal rainforest ecosystems to protect the resources related to subsistence needs; to protect and preserve historic and archeological sites, rivers, and lands, and to preserve wilderness resource values and related recreational opportunities including but not limited to hiking, canoeing, fishing, and sport hunting, within large arctic and subarctic wildlands and on free-flowing rivers; and to maintain opportunities for scientific research and undisturbed ecosystems.

". . . consistent with management of fish and wildlife in accordance with recognized scientific principles and the purposes for which each conservation system unit is established, designated, or expanded by or pursuant to this Act, to provide the opportunity for rural residents engaged in a subsistence way of life to continue to do so."

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. . . ." (Section 810(a))

### **III. PROPOSED ACTION ON FEDERAL LANDS**

This EA proposes 4 alternatives. Alternative 1 is the no action alternative. Alternative 2 proposes to plow the Park Road to mile 12 all winter along with some improvements to the Spring Trail. Alternative 3 proposes to plow the Park Road beginning in mid-January. Alternative 4 proposes to open the road beginning in mid-February for a trial period of 3 to 5 years. All alternatives are described in detail in this EA. Customary and traditional subsistence use on NPS lands will continue as authorized by Federal law and regulations under all alternatives.

### **IV. AFFECTED ENVIRONMENT**

Subsistence uses within Denali National Park and Preserve are permitted in accordance with ANILCA. Section 202(3)(a) of ANILCA allows local residents to engage in subsistence uses in the ANILCA additions to the park where such uses are traditional in accordance with the provisions in Title VIII. Lands within former Mount McKinley National Park are closed to subsistence uses.

A regional population of approximately 300 eligible local rural residents qualifies for subsistence use of park resources. Resident zone communities for Denali National Park and Preserve are Cantwell, Minchumina, Nikolai, and Telida. By virtue of their residence, local rural residents of these communities are eligible to pursue subsistence activities in the new park additions. Local rural residents who do not live in the designated resident zone communities, but who have

customarily and traditionally engaged in subsistence activities within the park additions, may continue to do so pursuant to a subsistence permit issued by the Park Superintendent.

The NPS realizes that Denali National Park and Preserve may be especially important to certain communities and households in the area for subsistence purposes. The resident zone communities of Minchumina (population 22) and Telida (population 11) use park and preserve lands for trapping and occasional moose hunting along area rivers. Nikolai (population 122) is a growing community and has used park resources in the past. Cantwell (population 147) is the largest resident zone community for Denali National Park and Preserve, and local residents hunt moose and caribou, trap, and harvest firewood and other subsistence resources in the new park area.

The main subsistence species, by edible weight, are moose, caribou, furbearers, and fish. Varieties of subsistence fish include coho, king, pink, and sockeye salmon. Burbot, dolly varden, grayling, lake trout, northern pike, rainbow trout, and whitefish are also among the variety of fish used by local people. Beaver, coyote, land otter, weasel, lynx, marten, mink, muskrat, red fox, wolf, and wolverine are important furbearer resources. Rock and willow ptarmigan, grouse, ducks, and geese are important subsistence wildlife resources.

The NPS 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 any given year may vary considerably from previous years because of such factors as weather, migration patterns, and natural population cycles. However, the pattern is assumed to be generally applicable to harvests in recent years with variations of reasonable magnitude.

## **V. SUBSISTENCE USES AND NEEDS EVALUATION**

To determine the potential impact on existing subsistence activities, three evaluation criteria were analyzed relative to existing subsistence resources that could be impacted.

The evaluation criteria are:

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

The potential to reduce populations:

Provisions of ANILCA and Federal and State regulations provide protection for fish and wildlife populations within Denali National Park and Preserve.

No change in the availability of subsistence resources is anticipated as a result of the proposed action.

Restriction of Access:

All rights of access for subsistence harvest on NPS land are granted by Section 811 of ANILCA. Denali National Park and Preserve is managed according to legislative mandates, NPS management policies and the park's General Management Plan. No actions under the alternatives described in the Environmental Assessment should affect the access of subsistence users to natural resources in the park and preserve.

#### Increase in Competition:

The alternatives should not produce any increase in competition for resources to subsistence users. If, and when, it is necessary to restrict taking, subsistence uses are the priority consumptive users on public lands of Alaska and will be given preference on such lands over other consumptive uses (ANILCA, Section 802(2)). Continued implementation of provisions of ANILCA should mitigate any increased competition, however, significant, from resource users other than subsistence users. Therefore, the proposed action would not adversely affect resource competition.

## **VI. AVAILABILITY OF OTHER LANDS**

Choosing a different alternative would not decrease the impacts to park resources for subsistence. All alternatives are consistent with the mandates of ANILCA, including Title VIII, and the NPS Organic Act.

## **VII. ALTERNATIVES CONSIDERED**

### **Alternative 1 – No Action – Continue to close road in winter**

During winter months snow on one lane of the Park Road will continue to be packed from the Headquarters gate to Mile 7 to allow maintenance activities that prevent the buildup of ice on the road in this section. If there is sufficient snow on the spring trail from Headquarters for safe travel by ski, skijor, and dog sled by March 1, the road would be plowed to Savage Campground. Otherwise, the Park Road would remain unplowed until clearing is needed to provide for road opening activities for summer season use. This section of the Park Road will be designated a Backcountry Hiker area during winter months.

### **Alternative 2 – Plow road for full winter season and allow additional improvements to the Spring Trail**

Under Alternative 2, the NPS would keep the Park Road open to Mountain Vista Rest Area year round. The road would be plowed on a high priority basis and additional staffing may be required. An emergency phone or radio with direct connection to park communications center would be installed at Mountain Vista Rest Area. The existing shelter at Mountain Vista Rest Area would be made into seasonal warming hut. Additional work on the Spring Trail would include removal of boulders and realignment of approximately 500' of trail near Hines Creek to improve usability. Paved sections of Riley Creek Campground not used for winter camping would be groomed using construction equipment and drag to serve as an alternative to the Park Road for beginner skiers and skijorers.

**Alternative 3 – Plow road for partial winter season beginning mid-January and minor changes to the Spring Trail**

Under Alternative 3, the NPS would open the Park Road in mid-January. The road would be plowed with no additional staffing. The road may occasionally close pending plowing following storm event. An emergency phone or radio with direct connection to park communications center would be installed at Mountain Vista Rest Area. Additional work to the Spring Trail would include removal of boulders. No grooming of trails would occur and winter over-snow trails would be established by users.

**Alternative 4 – Plow road on a trial basis for 3-5 years beginning mid-February**

Under Alternative 4, the NPS would open the Park Road to the Mountain Vista Rest Area for vehicle use in mid-February for a three – five year trial period. No additional staffing would be added and the road may occasionally close pending plowing following storm event. There would be no warming hut or emergency communication device installed. No improvements to the Spring Trail beyond those outlined in the 2002 Spring Trail EA are anticipated under this alternative. Winter over-snow trails would be established by users and trail grooming would not occur.

The NPS will evaluate visitation data after the trial period to determine if opening the road earlier to visitors warrants the increased operational costs. Depending on the findings, the park may eliminate the plowing effort or continue it annually.

**VIII. FINDINGS**

This analysis concludes that neither of the action alternative would result in a significant restriction of subsistence uses.

**Appendix B**

***Winter Road Plowing and Spring Trail Reroute***

*By:*  
*Phoebe J. Gilbert*

Cultural Resource Report No. 2013-DENA-001

Prepared for:  
Superintendent Jeff Mow  
Denali National Park and Preserve  
PO Box 9  
Denali, AK 99755

October 2012

## **Abstract**

The National Park Service is considering plowing the Denali Park Road in Denali National Park to the Mountain Vista Rest Area at mile 12 during winter months. Private and commercial vehicles would be allowed to travel into the park during times of the year that commercial services are not being offered at present. This project involves the potential rerouting of a section of the Spring Trail. Based on previous and current investigations, it is recommended that the Denali National Park and Preserve approach National Historic Preservation Act, Section 106 consultation as “No Historic Properties Affected”.

## *Introduction*

### **Description of Undertaking**

The National Park Service (NPS) is considering plowing the Denali Park Road (park road) in Denali National Park (DENA) to the Mountain Vista Rest Area at mile 12 during winter months; this undertaking will potentially involve the rerouting of the Spring Trail (trail) and potential ground disturbance. Currently dog teams and skijors use the unplowed road in the winter; reworking the trail would be needed to run dogs since they would be displaced from the road. Of the three alternatives being considered, two involve potential ground disturbances, and one involves a reroute of the trail. The potential reroute is 700 feet in length and would reroute the current spring trail from a sloping area with aufeis that presents a safety hazard to dog mushers and skijors to a safer level area. The trail is currently used mainly in the spring after the park road is plowed, but may become a year round trail if the park road is plowed to mile 12. Ground disturbing activities would involve the removal of boulders and tussocks from the trail to create a more even surface which would lessen the potential of injury to humans and canines.

#### **Alternative 1 – No Action – Continue to close road in winter**

During winter months snow on one lane of the park road will continue to be packed from the Headquarters gate to Mile 7 to allow maintenance activities that prevent the buildup of ice on the road in this section. If there is sufficient snow on the spring trail from Headquarters for safe travel by ski, skijor, and dog sled by March 1, the road could then be plowed to Savage Campground. Otherwise, the park road would remain unplowed until clearing is needed to provide for road opening activities for summer season use.

#### **Alternative 2 – Plow road for full winter season and allow additional improvements to the Spring Trail**

Under Alternative 2, the NPS would keep the Denali Park Road open to Mountain Vista Rest Area year round. The road would be plowed on a high priority basis and additional staffing may be required. The existing shelter at Mountain Vista Rest Area would be made into seasonal warming hut. Additional work on the Spring Trail would include removal of boulders and realignment of approximately 700' of trail near Hines Creek to improve usability. To reroute the trail an eight foot wide corridor would be brushed and large boulders and tussocks would potentially be removed.

#### **Alternative 3 – Plow road for partial winter season beginning mid-January and minor changes to the Spring Trail**

Under Alternative 3, the NPS would open the Park Road in mid-January. The road would be plowed to the Mountain Vista Rest Area with no additional staffing. The road may occasionally close pending plowing following a storm event. An emergency phone or radio with direct connection to park communications center would be installed at Mountain Vista Rest Area. Additional work to the Spring Trail would include removal of boulders. No grooming of trails would occur and winter over-snow trails would be established by users.

#### **Legal location for the undertaking:**

Section 7 T14S R7W FM (Figure 1)

### *Local Environment*

The project is located from mile 3.5 to mile 12 of the park road south of the park road at mile post 4.1, west of DENA Headquarters. The project occurs within the Alaska Range west of the Nenana River approximately 3.5 miles to 12 miles west of the Park entrance. Tundra ground cover and a spruce-poplar forest dominate vegetation within the project area. Plants include spruce, poplar, aspen, mosses, ferns, grasses, fireweed, and blueberries.

### **Records Checks**

DENA cultural resource records and GIS data were reviewed previous to this project, the proposed Area of Potential Effect (APE) (Figure. 1) has been previously inventoried (Davis 1983), additional survey was conducted of the proposed trail reroute. The APE includes the park road from mile 3.4 to mile 12 (381 acres), and the section of reroute on the spring trail (2 acres) located .75 miles due south of the park road at mile post 4.1.

### *Results of Inventory*

The potential reroute of the Spring Trail was surveyed, and no new historic properties were identified. The potential for subsurface cultural remains is very low. The park road (HEA-00429/MMK-00171) is located in the APE of this project. No other historic properties are located within the APE. There are several archaeological sites that are located near the APE along the park road. While there may be an increase in the number of visitors to the project area during the winter months as a result of this project, the sites located near the project area will not be impacted by this increase as it will be a fraction of the number of visitors that the area sees during the summer months.

### *Recommendations*

Only one historic property, the Denali Park Road (HEA-429/MMK-171), was identified within the APE for the proposed undertaking. The park road will not be affected by this project, as no changes will be made to the road. It may be appropriate for ground disturbing activities to be monitored by cultural resource staff. As designed, the project will not affect historic properties, and it is recommended that DENA approach National Historic Preservation Act, Section 106, consultation under 36 CFR Part 800.5(3)(b) as “No Historic Properties Affected”.

If cultural resources or items protected by the Native American Graves Protection and Repatriation Act are discovered during this project, all project-related activities in the vicinity of the discovery will be stopped and the park archaeologist will be notified immediately. Denali National Park and Preserve in consultation with the State Historic Preservation Officer will determine a course of action per 36 CFR Part 800.13.

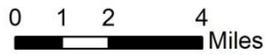
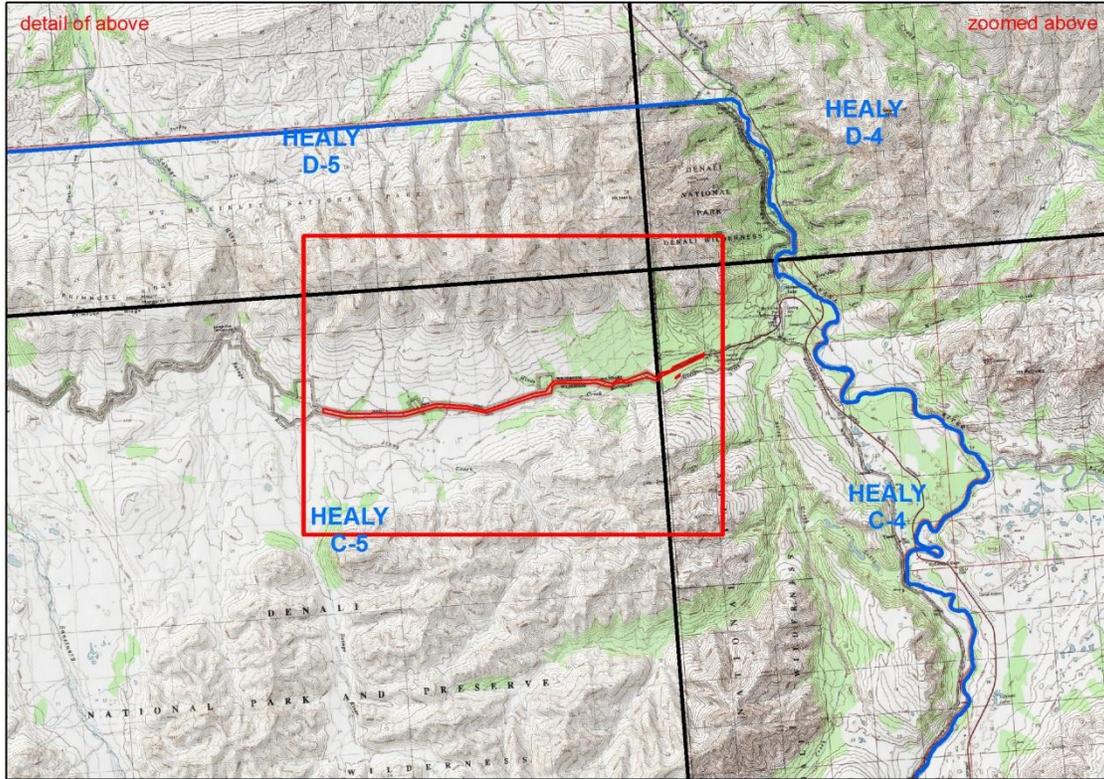
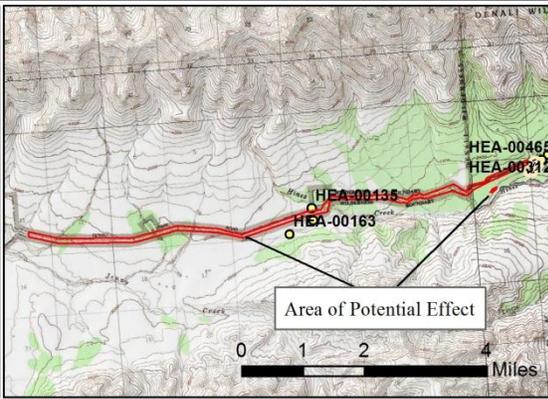
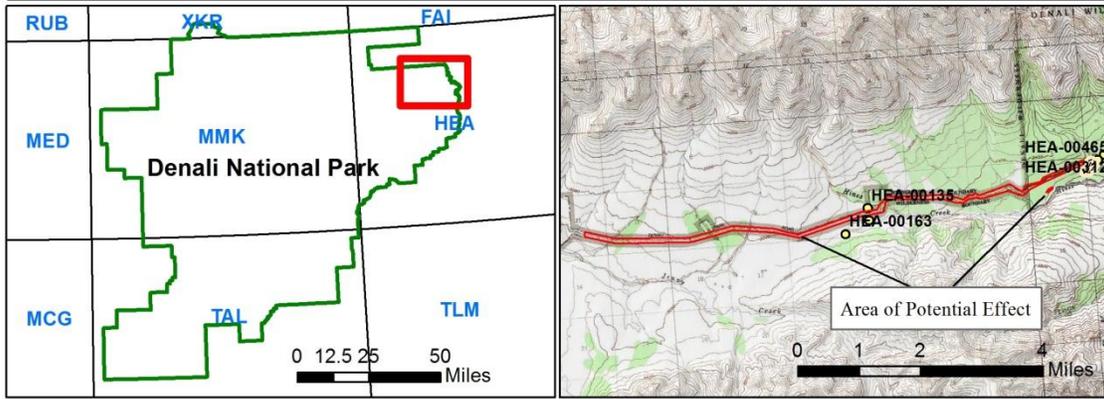
## References

Davis, Craig

1983 Field Notes, Archaeological Surveys within Denali National park and Preserve.  
On file at the NPS Alaska Regional Office, Anchorage.

**Cultural Resource Reprt  
No. 2013-DENA-001**

Denali National Park and Preserve  
National Park Service  
U.S. Department of the Interior



Source: Phoebe Gilbert  
National Park Service,  
Denali National Park and Preserve,  
October 2012



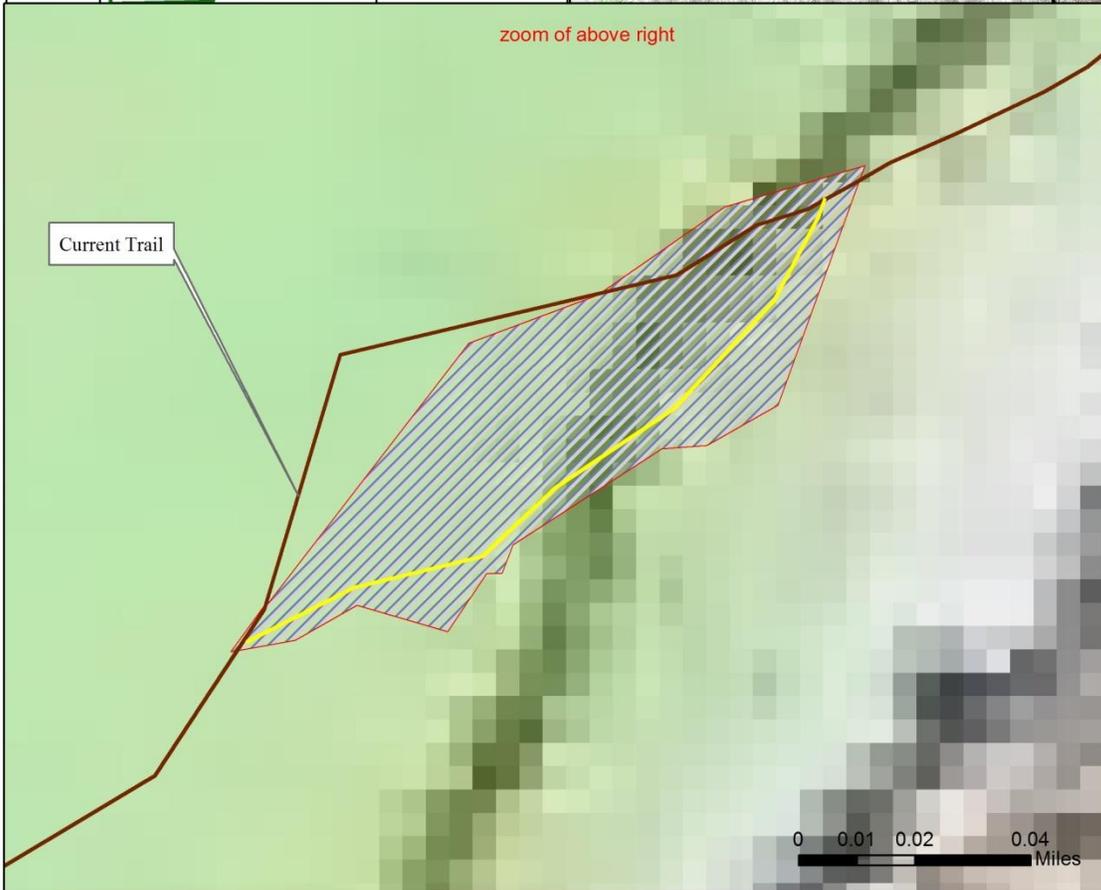
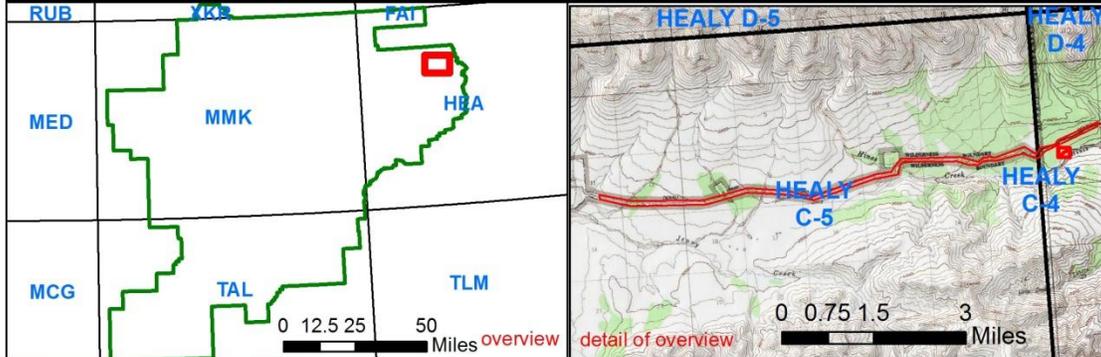
**Winter Road Plowing and Spring Trail Reroute**  
N 63.716625  
E -148.99069  
Datum WGS84

 Park Outline- DENA  
 Archaeological Sites

Figure 1- Project Location

**Cultural Resource Reprt  
No. 2013-DENA-001  
Detail of Trail Reroute**

Denali National Park and Preserve  
National Park Service  
U.S. Department of the Interior



Source: Phoebe Gilbert  
National Park Service,  
Denali National Park and Preserve,  
October 2012



**Winter Road Plowing and Spring Trail Reroute**  
**N 63.716625**  
**E -148.99069**  
**Datum WGS84**

- Trail Reroute
- Area of Potential Effect, Area Surveyed
- Archaeological Sites

Figure 2- Detail of Trail Reroute



Figure 3- Typical area of boulder/ tussock removal on current Spring Trail. Photograph taken on 10/01/12.



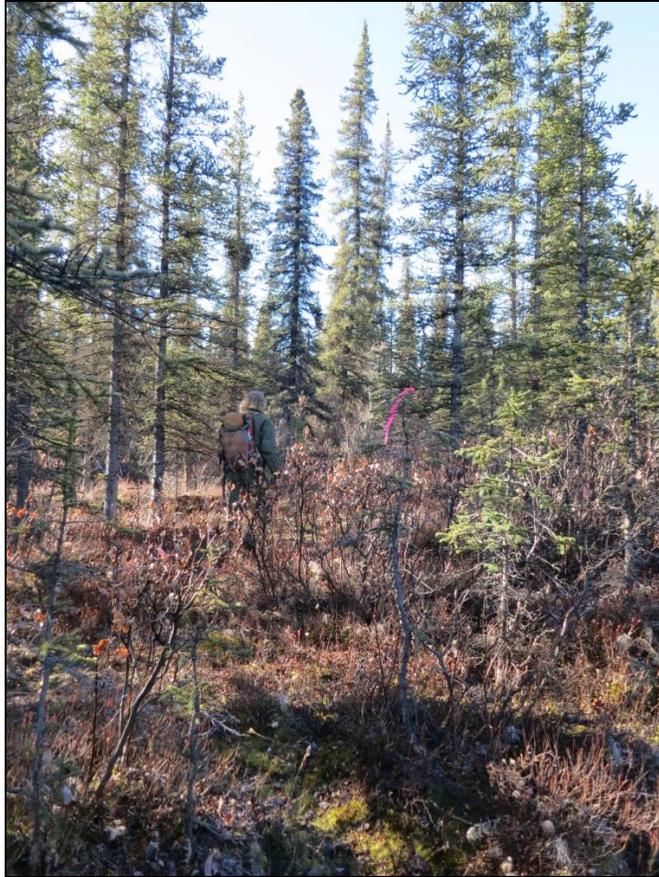
Figure 4- Looking west at section of spring trail to be rerouted. Photographed taken on 10/01/12.



**Figure 4:** Proposed reroute looking west. Photograph taken on 10/01/2012.



**Figure 5:** Continuation of proposed reroute looking west. Photograph taken on 10/01/2012.



**Figure 6:** Continuation of proposed reroute looking west. Photograph taken on 10/01/2012.

11.6.2012

3130-1K NPS



### United States Department of the Interior

NATIONAL PARK SERVICE  
Denali National Park & Preserve  
Mile 237 Parks Highway  
P.O. Box 9  
Denali Park, AK 99755

DENA ROUTING:		
	Initial	Date
Supt		
Asst Supt/Ops		
Asst Supt/Res		
PIO		
Miriam Hoelbe		

RECEIVED

5 2012

OHA

11/3/12  
copy sent to

D30/ H2623 (DENA)

October 22, 2012

Judith Bittner  
State Historic Preservation Officer  
Department of Natural Resources  
Office of History and Archaeology  
550 W. 7<sup>th</sup> Avenue, Suite 1310  
Anchorage, Alaska 99501-3565

**No Historic Properties Affected**  
**Alaska State Historic Preservation Officer**  
Date. 11-6-2012  
File No. 3130-1K NPS  
SAB

RE: Winter Road Plowing and Spring Trail Reroute, 2013-DENA-001

Dear Ms. Bittner:

Denali National Park and Preserve is considering plowing the Denali Park Road in Denali National Park to the Mountain Vista Rest Area at mile 12 during winter months. This undertaking will potentially involve the rerouting of the Spring Trail and potential ground disturbance.

Only one historic property, the Denali Park Road (HEA-429/ MMK-171), was identified within the APE for the proposed undertaking. The park road will not be affected by this project, and it is recommended that the Denali National Park and Preserve approach National Historic Preservation Act, Section 106, consultation under 36 CFR Part 800.5(3)(b) as "No Historic Properties Affected."

We appreciate your time and consideration in this matter. If you have any questions concerning this project, please contact Phoebe Gilbert at (907) 683-9540, [phoebe\\_gilbert@nps.gov](mailto:phoebe_gilbert@nps.gov).

Sincerely,

Jeff Mow  
Acting Superintendent

Enclosures



ARTHUR CARHART NATIONAL WILDERNESS TRAINING CENTER

# MINIMUM REQUIREMENTS DECISION GUIDE

## WORKSHEETS

*“ . . . except as necessary to meet minimum requirements for the administration of the area for the purpose of this Act...”*

– the Wilderness Act, 1964

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Project Title: Denali Park Road Winter Plowing Proposal/EA

**Step 1:** Determine if any administrative action is necessary.

*Description: Describe the situation that may prompt action.*

The National Park Service (NPS) is considering plowing the Denali Park Road (park road) in Denali National Park (park) to the Mountain Vista Rest Area at mile 12 during winter months. (see Figures 1 and 2 in the Environmental Assessment for project location). Plowing the Park Road does not occur in Wilderness however, the alternatives incorporate work on the Spring Trail which is in Wilderness. In addition, it is expected that visitor use patterns will change and bring potential impacts to the Denali Wilderness. Plowing would allow private and commercial vehicles to travel into the park during times of the year that commercial services are not being offered at present. The park road is usually closed to vehicle use by October 1 of each year and then re-opened beginning around mid-March to April 1. The primary goals of this proposed plan are to increase the range of opportunities for winter visitors & provide opportunities for winter visitors to view Mt. McKinley. The proposed action of plowing the Denali Park Road would impact winter park operations. Dog mushing by visitors and the Park Kennels would be affected. NPS dog teams provide non-motorized access for patrols and project work during the winter. Early in the winter season when snow cover is still thin, mushers and NPS musing patrols rely on the park road starting at Mile 3.25 to access the Denali Wilderness. Currently once the NPS starts plowing the park road in March an access trail called the "Spring Trail" is used by mushers. The Spring Trail is a minimally improved winter-only trail. This trail provides direct access from the kennels to the

rest of the Wilderness to the west, but requires a minimum level of snow to be usable by dog teams, thus the reason it is used in late winter/spring. If mushers don't have access to the first several miles of the Park Road in early/mid-winter they have several options, but what works best for their operations is to have access to the Spring Trail. Thus depending on the date of road opening, the Spring Trail may or may not need improvements in order to hold more snow for early winter mushing.

To determine if administrative action is necessary, answer the questions listed in A - F on the following pages by answering Yes or No, and providing an explanation.

#### A. Options Outside of Wilderness

Is action necessary within wilderness?

Yes:  No:

**Explain:** The Denali Road is not within designated Wilderness however, the Wilderness boundary is typically 150' on either side of the centerline. Road plowing would not occur within Wilderness.

#### B. Valid Existing Rights or Special Provisions of Wilderness Legislation

Is action necessary to satisfy valid existing rights or a special provision in wilderness legislation (the Wilderness Act of 1964 or subsequent wilderness laws) that allows or requires consideration of the Section 4(c) prohibited uses? Cite law and section.

Yes:  No:

**Explain:** No existing rights or special provisions apply in this case.

#### C. Requirements of Other Legislation

Is action necessary to meet the requirements of other laws? Cite law and section.

Yes:  No:

**Explain:** There is no provision of any other federal law that requires winter road clearance.

#### D. Other Guidance

Is action necessary to conform to direction contained in agency policy, unit and wilderness management plans, species recovery plans, or agreements with tribal, state and local governments or other federal agencies?

Yes:  No:

**Explain:** While the Denali NP& P Development Concept Plan (1996) calls for enhancement of visitor opportunities along the first 15 miles of road, there is no guidance that requires winter road clearance. In fact, more recent planning guidance (2006) BMP designates the area as a Backcountry Hiker Area during winter months. An environmental assessment was conducted in 2002 to improve the Spring Trail with or without winter road plowing. If the road is plowed, additional Spring Trail improvements not covered by the current EA will be necessary.

#### Denali National Park & Preserve Backcountry Management Plan, 2006

Denali's Backcountry Management Plan (BCMP) states: "During winter months snow on one lane of the park road will continue to be packed from the Headquarters gate to Mile 7 to allow

*maintenance activities that prevent the buildup of ice on the road in this section. If there is sufficient snow on the spring trail from Headquarters for safe travel by ski, skijor, and dog sled by March 1, the road would be plowed to Savage Campground. Otherwise, the park road would remain unplowed until clearing is needed to provide for road opening activities for summer season use. This section of the park road will be designated a Backcountry Hiker area during winter months.”*

#### Denali National Park & Preserve Development Concept Plan for the Entrance Area and Road Corridor, 1996

The DCP describes the plan for providing for visitor use and resource protection and related facility development in the entrance area and road corridor or frontcountry of Denali National Park and Preserve. This plan included new public transportation from the entrance area to Savage River Rest Stop along with trailheads to encourage visitors to leave their cars and explore parts of the park. The plan also called for the enhancement of visitor opportunities along the first 15 miles of the park road. These would include trail construction, wider road shoulders, new picnic areas, and improvements to rest areas to provide additional opportunities for leisurely day use experiences viewing animals and landscapes.

#### Environmental Assessment for Construction of a Springtime Dogsled and Skiing Trail from Headquarters to Mile 7 of the Park Road, 2002

In the NPS Preferred alternative the proposed Spring Trail will parallel the park road for 4 1/4 miles from Park Headquarters to mile 7.63, with all but one mile in designated wilderness. According to the plan, *“Curves in the trail will be broad and sweeping to provide adequate sight distance and passing width for dog teams as well as cross-country skiers and snowshoers. The alignment will minimize steep grades and cross slopes and will minimize problems with auffs.*

*Trail construction work will be limited to brushing and clearing an eight-foot wide corridor, and cutting the tops off the largest tussocks to level the trail as necessary. Work will be undertaken in winter after the surface of the ground is frozen. Tussocks will be cut using grub hoes and pulaskis and the cut material will be moved to fill the low spots. Brush and trees will be cut with motorized brush cutters, chainsaws, handsaws and polesaws. The use of those mechanized/motorized tools was approved in a project-specific minimum requirement analysis. Brush will be scattered out of sight and firewood-size wood will be stacked near the trail and hauled by dog sled during the winter to Park Headquarters or to ranger patrol cabins. Temporary wooden plank bridges will be used at the three creek crossings until there is adequate snow and ice to cover the floodplain boulders. No borrow material will be needed for the construction, and no revegetation work will be part of the plan. The trail will not be signed or mapped for summer use.*

*Of the 4 1/4 miles of trail, approximately 3 miles will follow previous clearing work, although the full length will need to be brought to the 8 foot wide standard. The trailhead for visitors will be at the parking area used by the Dog Demonstration buses in the summer.”*

### E. Wilderness Character

Is action necessary to preserve one or more of the qualities of wilderness character including: Untrammeled, Undeveloped, Natural, Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation, or Unique Attributes or Other Features that reflect the character of this wilderness area?

Untrammeled:            Yes:         No:

**Explain:** Action is not necessary to preserve the untrammeled quality of Denali's Wilderness.

Undeveloped:            Yes:         No:

**Explain:** Action is not necessary to preserve the undeveloped quality of Denali's Wilderness.

Natural:                    Yes:         No:

**Explain:** Action is not necessary to preserve the natural quality of Denali's Wilderness.

**Outstanding Opportunities for Solitude or Primitive and Unconfined Recreation:**

                                  Yes:         No:

**Explain:** Action is not necessary to preserve the experiential quality of Denali's Wilderness.

**Unique Attributes or Other Features that reflect the character of this wilderness:**

                                  Yes:         No:

**Explain:** Action is not necessary to preserve unique attributes of Denali's Wilderness.

### F. Public Purposes

Is action necessary to protect one or more of the public purposes for wilderness (as stated in Section 4(b) of the Wilderness Act) of recreational, scenic, scientific, educational, conservation, and historical use?

Recreational:            Yes:         No:

**Explain:** Plowing the road would provide an increased range of recreational opportunities by improving winter road access to the Denali Wilderness.

Park Service Organic Act of 1916, Section 3 states: *"The service thus established shall promote and regulate the use of the Federal areas known as national parks, monuments, and reservations hereinafter specified by such means and measures as conform to the fundamental purposes of the said parks, monuments, and reservations, which purpose is to*

*conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."*

Alaska National Interest Lands Conservation Act designated most of the former Mount McKinley National Park as the Denali Wilderness in Sections 701 to be managed in accordance with The Wilderness Act outlined in Section 707.

In 1917, Congress established Mount McKinley National Park: *"...as a public park for the benefit and enjoyment of the people..."* and *"...as a game refuge..."* (39 Statute 938)

**Scenic:**                      **Yes:**       **No:**

**Explain:** Plowing the road would increase the scenic opportunities looking out into the Denali Wilderness by visitors using the road and those using it for access to the wilderness.

In 1917, Congress established Mount McKinley National Park: *"...as a public park for the benefit and enjoyment of the people..."* and *"...as a game refuge..."* (39 Statute 938)

Alaska National Interest Lands Conservation Act designated most of the former Mount McKinley National Park as the Denali Wilderness in Sections 701 to be managed in accordance with the Wilderness Act outlined in Section 707.

**Scientific:**                      **Yes:**       **No:**

**Explain:** Action is not necessary to protect the scientific purpose of Denali's Wilderness.

**Educational:**                      **Yes:**       **No:**

**Explain:** Action is not necessary to protect the educational purpose of Denali's Wilderness.

**Conservation:**                      **Yes:**       **No:**

**Explain:** Action is not necessary to protect the conservation purpose of Denali's Wilderness.

**Historical:**                      **Yes:**       **No:**

**Explain:** Action is not necessary to protect the historical purpose of Denali's Wilderness.

**Step 1 Decision: Is any administrative action necessary in wilderness?**

Yes:  No:

**Explain:** Plowing the Denali Road to provide for increased winter recreation opportunities is not required by law or policy. Winter plowing of the Denali Road runs counter to guidance provided in the Denali National Park & Preserve Backcountry Management Plan, 2006, but may enhance the recreation and scenic purposes of Wilderness. The project is not necessary but could be undertaken if the benefits to the wilderness character are enhanced. Following is an analysis of the proposed alternatives for accomplishing the project while enhancing and/or preserving wilderness character.

**Step 2: Determine the minimum activity.**

**Description of Alternatives**

For each alternative, *describe what the action is, when the activity will take place, where the activity will take place, and what methods and techniques will be used. Detail the impacts to the qualities of wilderness character and other comparison criteria, including safety. Where mitigation is possible, include mitigation measures. In addition to describing the effects of the alternative, it may be useful to break down each alternative into its component parts and list in tabular form the impacts to each comparison criterion.*

**Alternative #1: No Action**

**Description:** During winter months snow on one lane of the park road will continue to be packed from the Headquarters gate to Mile 7 to allow maintenance activities that prevent the buildup of ice on the road in this section. If there is sufficient snow on the spring trail from Headquarters for safe travel by ski, skijor, and dog sled by March 1, the road could then be plowed to Savage Campground. Otherwise, the park road would remain unplowed until clearing is needed to provide for road opening activities for summer season use. This section of the park road will be designated a Backcountry Hiker area during winter months.

**Impacts to Wilderness Character:**

**Untrammelled:** No new impacts to wilderness.

**Undeveloped:** Positive impacts to wilderness due to the maintenance of the Backcountry Hiker zone that the Denali Road becomes in the winter. This essentially makes the road a non-motorized winter trail. There would be no additional developments to the already primitive Spring Trail.

**Natural:** The noise associated with increased vehicular traffic, road plowing, and increased visitor use would not occur under the no action alternative and better preserve the natural soundscape of the area and surrounding wilderness.

**Solitude or Primitive and Unconfined Recreation:**

Positive impacts to wilderness due to the maintenance of outstanding opportunities for solitude and unconfined and primitive type of recreation that is available in the eastern portion of the Denali Wilderness during winter months. There would be no significant increase in commercial use or visitation with the associated impacts.

**Unique Attributes or Other Features:**

No new impacts to wilderness. Fewer opportunities for scenic viewing as compared to Alternatives 2, 3 & 4.

**Impacts to other criteria:**

**Maintaining Traditional Skills:** The no action alternative allows the NPS Kennels to operate as they have been without the assistance of vehicles to access the Denali Wilderness via the Park Road. This also allows for optimal training of puppies using the Park Road in early winter. In addition, the primitive and challenging nature of the Spring Trail demands a significant level of skill for mushers to navigate.

**Special Provisions:**

No new impacts to wilderness. Fewer opportunities for winter visitor use compared to Alternatives 2, 3 & 4.

**Economics and Timing Constraints:**

No new impacts to wilderness.

**Impacts to safety of visitors and workers:**

Fewer visitors in wilderness reduce the exposure to risk of potential visitors and staff. The primitive nature of the Spring Trail does expose mushers to higher level of potential risks.

**Impacts Comparison Tables**

**Wilderness Character**

**Untrameled**

	positive impacts	negative impacts	
1 <sup>st</sup> component:			<b>Untrameled Grand Total</b>
2 <sup>nd</sup> component:			
3 <sup>rd</sup> component:			
4 <sup>th</sup> component:			
<b>TOTAL</b>	0	0	

**Undeveloped**

	positive impacts	negative impacts	
no additional developments to the Spring Trail.	1		<b>Undeveloped Grand Total</b>
3 <sup>rd</sup> component:			
4 <sup>th</sup> component:			
<b>TOTAL</b>	1	0	

**Natural**

	positive impacts	negative impacts	Natural Grand Total
preserve the natural soundscape	1		
2 <sup>nd</sup> component:			
3 <sup>rd</sup> component:			
4 <sup>th</sup> component:			
TOTAL	1	0	1

**Solitude or Primitive and Unconfined Recreation**

	positive impacts	negative impacts	S or P&UR Grand Total
opportunities for solitude & unconfined/primitive type of recreation	1		
2 <sup>nd</sup> component			
3 <sup>rd</sup> component:			
4 <sup>th</sup> component:			
TOTAL	1	0	1

**Unique Attributes or Other Features**

	positive impacts	negative impacts	UA or OF Grand Total
Limited opportunities for scenic viewing		1	
2 <sup>nd</sup> component:			
3 <sup>rd</sup> component:			
4 <sup>th</sup> component:			
TOTAL	0	1	-1

**Other Criteria**

**Maintaining Traditional Skills**

	actions with beneficial effects	actions with adverse effects	Traditional Skills Grand Total
optimal training of puppies	1		
primitive and challenging nature of the Spring Trail	1		
3 <sup>rd</sup> component:			
4 <sup>th</sup> component:			
TOTAL	2	0	2

*Special Provisions*

	positive impacts	negative impacts	
Limited opportunities "for the benefit and enjoyment of the people"		1	<b>Special Provisions Grand Total</b>
2 <sup>nd</sup> component:			
3 <sup>rd</sup> component:			
4 <sup>th</sup> component:			
<b>TOTAL</b>	0	1	

**Economics and Timing Constraints**

	positive impacts	negative impacts	
1 <sup>st</sup> component:			<b>Economics &amp; Timing Grand Total</b>
2 <sup>nd</sup> component:			
3 <sup>rd</sup> component:			
4 <sup>th</sup> component:			
<b>TOTAL</b>	0	0	

**Safety of Visitors and Workers**

	positive impacts	negative impacts	
Fewer rescues expected	1		<b>Safety Grand Total</b>
2 <sup>nd</sup> component:			
3 <sup>rd</sup> component:			
4 <sup>th</sup> component:			
<b>TOTAL</b>	1	0	

**Alternative # 2: Plow the road for full winter season and allow additional improvements to the Spring Trail**

**Description:** The NPS would keep the Denali Park Road open to Mountain Vista Rest Area year round. The road would be plowed on a high priority basis and additional staffing may be required. An emergency phone or radio with direct connection to the park communications center would be installed at Mountain Vista Rest Area. The existing shelter at Mountain Vista Rest Area would be made into seasonal warming hut. Additional work on the Spring Trail would include removal of boulders and realignment of approximately 1000' of trail near Hines Creek to improve usability. Paved sections of Riley Creek Campground not used for winter camping would be groomed using construction equipment and drag to serve as an alternative to the park road for beginner skiers and skijorers.

Implementation of this alternative may include a phased approach with a trial period as outlined in Alternative 4, followed by a mid-January start date as outlined in Alternative 3 prior to opening the road for the full season in out years.

**Impacts to Wilderness Character:**

**Untrammeled:** Although some trail work in wilderness along the Spring Trail would be needed, the impact to the untrammeled character of the wilderness would be minor and not considered significant enough to include in this analysis.

**Undeveloped:** Negative impacts to wilderness would include changing the Road's winter designation of a backcountry hiker zone and defacto wilderness to one allowing motorized use. The presence of commercial operations in the form of tour buses and groups would degrade the undeveloped quality of the area and surrounding wilderness. Improvements to the Spring Trail degrades the undeveloped quality by decreasing the primitive state of the trail and short term use of motorized or mechanized tools for the realignment work. The impacts and mitigations for this work will be addressed in a separate MRA or in the programmatic MRA for trails maintenance.

**Natural:** Trail work in wilderness along the Spring Trail could impact to the natural character of the wilderness in the short term until area re-routed is restored to a natural condition.

**Solitude or Primitive and Unconfined Recreation:**

This alternative has a direct impact on the outstanding opportunity for solitude quality by allowing motorized vehicles to use the road during winter months (sights and sounds of people and mechanization), particularly for those people using units 3,4, 24, 25, and 26. Short term impacts of trail crew presence and tools would occur during the Spring Trail realignment. Public access would improve for a larger portion of DENA during the winter months; this may improve recreational opportunities visitors but may also result in reduced opportunities for solitude in some areas.

**Unique Attributes or Other Features:**

Improved opportunities for scenic viewing during the winter months would be expected.

## Impacts to other criteria:

**Maintaining Traditional Skills:** Impacts to the dog mushers from plowing the road would be mitigated by the improvements to the Spring Trail.

**Special Provisions:** This proposed action does not have specific plans for commercial activities within wilderness; however, plowing the Denali Park Road would provide the potential for increased access to the Denali Wilderness. The Park's BCMP follows guidelines outlined by NPS Management Policies 10.2.2, and The Wilderness Act. To date commercial services have not been found necessary in Wilderness with a few exception (mountaineering, dog mushing, and some specific areas for guided hiking).  
For commercial activities in wilderness the following guidance applies from the Wilderness Act: Wilderness Act (16 USC Sections 1131-1136, 78 Stat. 890). The Wilderness Act provides two pieces of guidance related to commercial activities in wilderness.

- Section 4(c): "Except as specifically provided for in this Act, and subject to existing private rights, there shall be no commercial enterprise...within any wilderness area..."
- Section 6: "Commercial services may be performed within the wilderness areas designated by this Act to the extent necessary for activities which are proper for realizing the recreational or other wilderness purposes of the area."

Guidance from original legislation establishing the Park, "...as a public park for the benefit and enjoyment of the people..." and "...as a game refuge..." This alternative would enhance visitor opportunities to enjoy their park during the winter season.

## Economics and Timing Constraints:

The estimated cost of plowing the Park Road could be whole or partially offset by increased revenue from entrance fees and/or concessions franchise fees associated with increased winter use (See Appendix E; Cost Estimates). The greater need to increase staffing levels and increased maintenance costs for existing and new facilities would most likely far exceed any increase in revenue.

## Impacts to safety of visitors and workers:

The increased risk to visitors in wilderness is mitigated for by providing more active LE Ranger presence, a warming hut and phone at the Mountain Vista Rest Area, and with increased NPS staff presence on the road however, this would also expose staff to more risk. Improving the trail would increase the safety for staff and visitors using it but may increase use on the trail. Potential exposure of visitors and staff to severe weather for the entire winter season presents increased potential risk.

## Impacts Comparison Tables

### Wilderness Character

#### Untrameled

	positive impacts	negative impacts	
1 <sup>st</sup> component:			
2 <sup>nd</sup> component:			
3 <sup>rd</sup> component:			
4 <sup>th</sup> component:			
<b>TOTAL</b>	0	0	<b>Untrameled Grand Total</b> 0

#### Undeveloped

	positive impacts	negative impacts	
use of motorized or mechanized tools for the realignment work		1	
2 <sup>nd</sup> component:			
3 <sup>rd</sup> component:			
4 <sup>th</sup> component:			
<b>TOTAL</b>	0	1	<b>Undeveloped Grand Total</b> -1

#### Natural

	positive impacts	negative impacts	
Impacts associated to re-route of Spring Trail		1	
2 <sup>nd</sup> component:			
3 <sup>rd</sup> component:			
4 <sup>th</sup> component:			
<b>TOTAL</b>	0	1	<b>Natural Grand Total</b> -1

#### Solitude or Primitive and Unconfined Recreation

	positive impacts	negative impacts	
sights and sounds of people and mechanization		1	
trail crew presence		1	
improve recreational opportunities	1		
4 <sup>th</sup> component:			
<b>TOTAL</b>	1	2	<b>S or P&amp;UR Grand Total</b> -1

### Unique Attributes or Other Features

	positive impacts	negative impacts	UA or OF Grand Total
opportunities for scenic viewing	1		
2 <sup>nd</sup> component:			
3 <sup>rd</sup> component:			
4 <sup>th</sup> component:			
<b>TOTAL</b>	<b>1</b>	<b>0</b>	<b>1</b>

### Other Criteria

#### ~~Maintaining Traditional Skills~~

	actions with beneficial effects	actions with adverse effects	Traditional Skills Grand Total
1 <sup>st</sup> component:			
2 <sup>nd</sup> component:			
3 <sup>rd</sup> component:			
4 <sup>th</sup> component:			
<b>TOTAL</b>	<b>0</b>	<b>0</b>	<b>0</b>

#### *Special Provisions*

	positive impacts	negative impacts	Special Provisions Grand Total
enhance opportunities "for the benefit and enjoyment of the people" all year	2		
2 <sup>nd</sup> component:			
3 <sup>rd</sup> component:			
4 <sup>th</sup> component:			
<b>TOTAL</b>	<b>2</b>	<b>0</b>	<b>2</b>

#### Economics and Timing Constraints

	positive impacts	negative impacts	Economics & Timing Grand Total
increased revenue	1	1	
increase staffing levels		1	
3 <sup>rd</sup> component:			
4 <sup>th</sup> component:			
<b>TOTAL</b>	<b>1</b>	<b>2</b>	<b>-1</b>

#### Safety of Visitors and Workers

	positive impacts	negative impacts	Safety Grand Total
Expose staff to more risk		1	
Expose visitors to more risk		1	
Entire winter season		1	
Emergency phone/radio and warming hut at Mt Vista	2		
<b>TOTAL</b>	<b>2</b>	<b>3</b>	<b>-1</b>

**Alternative #3: Plow road for partial winter season beginning mid-January with minor changes to the Spring Trail.**

**Description:** Under Alternative 3, the NPS would open the Park Road on mid-January. The road would be plowed to the Mountain Vista Rest Area with no additional staffing. The road may occasionally close pending plowing following a storm event. An emergency phone or radio with direct connection to park communications center would be installed at Mountain Vista Rest Area. No vehicle plug-ins would be installed at the rest area and there would be no warming hut. Additional work to the Spring Trail would be limited to boulder relocation out of trail. No grooming of trails would occur and winter over-snow trails would be established by users.

Implementation of this alternative may include a phased approach with a trial period as outlined in Alternative 4.

**Impacts to Wilderness Character:**

**Untrammeled:** Although some trail work in wilderness along the Spring Trail would be needed the impact to the untrammeled character of the wilderness would be minor and not considered significant enough to include in this analysis.

**Undeveloped:** Negative impacts to wilderness would include changing the Road's winter designation of a backcountry hiker zone and defacto wilderness to one allowing motorized use. The presence of commercial operations in the form of tour buses and groups would degrade the undeveloped quality of the area and surrounding wilderness although for a shorter period of time than Alternative #2. Improvements to the Spring Trail degrades the undeveloped quality by decreasing the primitive state of the trail and short term use of motorized or mechanized tools for the removal of boulders.

**Natural:** Although some trail work in wilderness along the Spring Trail would be needed the impact to the natural character of the wilderness would be minor and not considered significant enough to include in this analysis.

**Solitude or Primitive and Unconfined Recreation:**

This alternative has less of a direct impact than Alternative #2 but still impacts opportunities for solitude by allowing motorized vehicles to use the road during winter months, (sights and sounds of people and mechanization), particularly for those people using units 3,4, 24, 25, and 26. Short term impacts of trail crew presence and tools would occur during work on the Spring Trail. Public access would improve for a larger portion of DENA during the winter months (Jan/Feb); this may improve recreational opportunities visitors but may also result in reduced opportunities for solitude in some areas.

**Unique Attributes or Other Features:**

Improved opportunities for scenic viewing, although less than Alternative #2, during the winter months would be expected.

**Impacts to other criteria:**

**Maintaining Traditional Skills:** The impacts to the dog mushers from plowing the road would be mitigated by the improvements to the Spring Trail. Winter plowing for a shorter duration and fewer improvements to the Spring Trail than Alternative #2 could provide a slightly greater opportunity to develop mushing skills in a more challenging manner.

**Special Provisions:**

This proposed action does not have specific plans for commercial activities within wilderness; however, plowing the Denali Park Road would provide the potential for increased access to the Denali Wilderness for commercial activities in the winter. For commercial activities in wilderness the following guidance applies from the Wilderness Act: Wilderness Act (16 USC Sections 1131-1136, 78 Stat. 890). The Wilderness Act provides two pieces of guidance related to commercial activities in wilderness.

- Section 4(c): "Except as specifically provided for in this Act, and subject to existing private rights, there shall be no commercial enterprise...within any wilderness area..."
- Section 6: "Commercial services may be performed within the wilderness areas designated by this Act to the extent necessary for activities which are proper for realizing the recreational or other wilderness purposes of the area."

Guidance from original legislation establishing the Park, "...as a public park for the benefit and enjoyment of the people..." This alternative would enhance visitor opportunities to enjoy their park during the winter season.

**Economics and Timing Constraints:**

The estimated cost of plowing the Park Road could be whole or partially offset by increased revenue from entrance fees and/or concessions franchise fees associated with increased winter use (See Appendix E; Cost Estimates). A shorter plowing season and fewer facilities would reduce staffing and maintenance costs however, it is unknown these costs would be covered by increased revenues.

**Impacts to safety of visitors and workers:**

The increased risk to visitors in wilderness is mitigated for by providing more active LE Ranger presence and with increased NPS staff presence on the road however, this would also expose staff to more risk. The lack of facilities makes it more difficult for visitors to seek help and deal with emergencies. Improving the trail would increase the safety for staff and visitors using it but may increase use on the trail. Potential exposure of visitors and staff to severe weather for only a portion of the winter reduces potential risk as opposed to Alternative 2 however, this could be offset by a lack of facilities.

## Impacts Comparison Tables

### Wilderness Character

#### Untrameled

	positive impacts	negative impacts	
1 <sup>st</sup> component:			
2 <sup>nd</sup> component:			
3 <sup>rd</sup> component:			
4 <sup>th</sup> component:			
<b>TOTAL</b>	0	0	<b>Untrameled Grand Total</b> 0

#### Undeveloped

	positive impacts	negative impacts	
use of motorized or mechanized tools for the		1	
2 <sup>nd</sup> component:			
3 <sup>rd</sup> component:			
4 <sup>th</sup> component:			
<b>TOTAL</b>	0	1	<b>Undeveloped Grand Total</b> -1

#### Natural

	positive impacts	negative impacts	
Trail work on Spring Trail		1	
2 <sup>nd</sup> component:			
3 <sup>rd</sup> component:			
4 <sup>th</sup> component:			
<b>TOTAL</b>	0	1	<b>Natural Grand Total</b> -1

#### Solitude or Primitive and Unconfined Recreation

	positive impacts	negative impacts	
sights and sounds of people and mechanization		1	
improve recreational opportunities	1		
3 <sup>rd</sup> component:			
4 <sup>th</sup> component:			
<b>TOTAL</b>	1	1	<b>S or P&amp;UR Grand Total</b> 0

**Unique Attributes or Other Features**

	positive impacts	negative impacts	UA or OF Grand Total
opportunities for scenic viewing	1		
2 <sup>nd</sup> component:			
3 <sup>rd</sup> component:			
4 <sup>th</sup> component:			
TOTAL	1	0	1

**Other Criteria**

**Maintaining Traditional Skills**

	actions with beneficial effects	actions with adverse effects	Traditional Skills Grand Total
greater opportunity to develop mushing skills	1		
2 <sup>nd</sup> component:			
3 <sup>rd</sup> component:			
4 <sup>th</sup> component:			
TOTAL	1	0	1

*Special Provisions*

	positive impacts	negative impacts	Special Provisions Grand Total
enhance opportunities "for the benefit and enjoyment of the people"	1		
Impacts to wildlife; "game refuge"		1	
3 <sup>rd</sup> component:			
4 <sup>th</sup> component:			
TOTAL	1	1	0

**Economics and Timing Constraints**

	positive impacts	negative impacts	Economics & Timing Grand Total
increased revenue	1	1	
no need for additional staff	1		
3-5 year trial period	1		
4 <sup>th</sup> component:			
TOTAL	3	1	2

**Safety of Visitors and Workers**

	positive impacts	negative impacts	Safety Grand Total
Expose staff to more risk		1	
Expose visitors to more risk		1	
Emergency phone/radio at Mt. Vista	1		
4 <sup>th</sup> component:			
TOTAL	1	2	-1

**Alternative #4: Plow road on trial basis for 3-5 years beginning in mid-February (NPS Preferred).**

**Description:** Under Alternative 4, the NPS would open the Park Road to the Mountain Vista Rest Area for vehicle use in mid-February for a three – five year trial peoriod. The road would be plowed to the Mountain Vista Rest Area with no additional staffing. The road may occasionally close pending plowing following a storm event. No warming hut or emergency communication device installed. No improvements to the Spring Trail beyond those outlined in the 2002 Spring Trail EA are anticipated under this alternative.

**Impacts to Wilderness Character:**

**Untrammeled:** No improvements to the Spring Trail beyond those outlined in the 2002 Spring Trail EA are anticipated under this alternative.

**Undeveloped:** Improvements to the Spring Trail would be covered under the 2002 Spring Trail EA.

**Natural:** Any trail work on the Spring Trail would be covered under the 2002 Spring Trail EA.

**Solitude or Primitive and Unconfined Recreation:**

This alternative has less of a direct impact than Alternative #2 but still impacts opportunities for solitude by allowing motorized vehicles to use the road during winter month(Feb) with sights and sounds of people and mechanization, particularly for those people using units 3,4, 24, 25, and 26. Public access would improve for a larger portion of DENA during the winter months; this may improve recreational opportunities visitors but may also result in reduced opportunities for solitude in some areas.

**Unique Attributes or Other Features:**

Improved oppourtunities for scenic viewing, although less than Alternative #2, during the winter months would be expected.

**Impacts to other criteria:**

**Maintaining Traditional Skills:** With winter plowing for a shorter duration and fewer improvements to the Spring Trail than Alternative #2 this alternative could provide a slightly greater opportunity to develop dog mushing skills.. However, this may also present safety concerns by increasing transport time and decrease training time for dogs and new mushers.

**Special Provisions:**

Guidance from original legislation establishing the Park, "...as a public park for the benefit and enjoyment of the people..." and "as a game refuge..."purpose This alternative would enhance visitor opportunities to enjoy their park during the winter season.

**Economics and Timing Constraints:**

The estimated cost of plowing the Park Road could be whole or partially offset by increased revenue from entrance fees and/or concessions franchise fees associated with increased winter use (See Appendix E; Cost Estimates). A shorter plowing season and fewer facilities would reduce staffing and maintenance costs however, it is unknown these costs would be covered by increased revenues.

**Impacts to safety of visitors and workers:**

The increased risk to visitors in wilderness is mitigated by providing more active LE Ranger presence and with increased NPS maintenance staff presence on the road however, this would also expose staff to more risk. The lack of facilities makes it more difficult for visitors to seek help and deal with emergencies. Potential exposure of visitors and staff to severe weather for only a portion of the winter reduces potential risk as opposed to Alternative 2 however, this could be offset by a lack of emergency facilities.

**Impacts Comparison Tables**

**Wilderness Character**

**Untrammeled**

	positive impacts	negative impacts	
1 <sup>st</sup> component:			<b>Untrammeled Grand Total</b>
2 <sup>nd</sup> component:			
3 <sup>rd</sup> component:			
4 <sup>th</sup> component:			
<b>TOTAL</b>	0	0	

**Undeveloped**

	positive impacts	negative impacts	
1 <sup>st</sup> component:			<b>Undeveloped Grand Total</b>
2 <sup>nd</sup> component:			
3 <sup>rd</sup> component:			
4 <sup>th</sup> component:			
<b>TOTAL</b>	0	0	

**Natural**

	positive impacts	negative impacts	
1 <sup>st</sup> component:			<b>Natural Grand Total</b>
2 <sup>nd</sup> component:			
3 <sup>rd</sup> component:			
4 <sup>th</sup> component:			
<b>TOTAL</b>	0	0	

**Solitude or Primitive and Unconfined Recreation**

	positive impacts	negative impacts	
sights and sounds of people and mechanization		1	
improve recreational opportunities	1		
3 <sup>rd</sup> component:			
4 <sup>th</sup> component:			
<b>TOTAL</b>	<b>1</b>	<b>1</b>	<b>S or P&amp;UR Grand Total</b> <b>0</b>

**Unique Attributes or Other Features**

	positive impacts	negative impacts	
opportunities for scenic viewing	1		
2 <sup>nd</sup> component:			
3 <sup>rd</sup> component:			
4 <sup>th</sup> component:			
<b>TOTAL</b>	<b>1</b>	<b>0</b>	<b>UA or OF Grand Total</b> <b>1</b>

**Other Criteria**

**Maintaining Traditional Skills**

	actions with beneficial effects	actions with adverse effects	
greater opportunity to develop mushing skills	1		
2 <sup>nd</sup> component:			
3 <sup>rd</sup> component:			
4 <sup>th</sup> component:			
<b>TOTAL</b>	<b>1</b>	<b>0</b>	<b>Traditional Skills Grand Total</b> <b>1</b>

*Special Provisions*

	positive impacts	negative impacts	
enhance opportunities "for the benefit and enjoyment of the people"	1		
Impacts to wildlife; "game refuge"		1	
3 <sup>rd</sup> component:			
4 <sup>th</sup> component:			
<b>TOTAL</b>	<b>1</b>	<b>1</b>	<b>Special Provisions Grand Total</b> <b>0</b>

### Economics and Timing Constraints

	positive impacts	negative impacts	Economics & Timing Grand Total
increased revenue	1	1	
no need for additional staff	1		
3-5 year trial period	1		
4 <sup>th</sup> component:			
TOTAL	3	1	2

### Safety of Visitors and Workers

	positive impacts	negative impacts	Safety Grand Total
expose staff to more risk		1	
expose visitors to more risk		1	
3 <sup>rd</sup> component:			
4 <sup>th</sup> component:			
TOTAL	0	2	-2

## Comparison of Alternatives

It may be useful to compare each alternative's positive and negative impacts to each of the criteria in tabular form, keeping in mind the law's mandate to "preserve wilderness character."

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Untrammeled	0	0	0	0
Undeveloped	1	-1	-1	0
Natural	1	-1	-1	0
Solitude or Primitive and Unconfined Recreation	1	-1	0	0
Unique / Other Features	-1	1	1	1
<b>WILDERNESS CHARACTER</b>	2	-2	-1	1

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
Maintaining Traditional Skills	2	0	1	1
Special Provisions	-1	2	0	0
Economics & Timing	0	-1	2	2
<b>OTHER CRITERIA SUMMARY</b>	1	1	3	3

	Alternative 1	Alternative 2	Alternative 3	Alternative 4
<b>SAFETY (visitors &amp; workers)</b>	1	-1	-1	-2

### Safety Criterion

The safety issues for visitors and workers within the wilderness would be related to ease of access, preparedness to deal with extreme winter conditions, and access to emergency facilities. Increasing public access along the Denali Road during the winter months would increase visitor and employee exposure to potentially hazardous conditions. Visitor education to be prepared for and survive in winter environments would reduce some of the risk.

### Documentation:

There was no specific documentation to support safety concerns to wilderness associated with the plowing of the Denali Road.

**Step 2 Decision: What is the Minimum Activity?**

**Selected alternative: No Action Alternative**

**Rationale for selecting this alternative (including safety criterion, if appropriate):**

The No Action Alternative would most effectively protect the wilderness character of Denali National Park and Preserve. In addition, the No Action Alternative adheres to the planning guidance provided by the Denali National Park & Preserve Backcountry Management Plan, 2006 (DNPP BMP). The other alternatives would require an amendment to DNPP BMP.

The minimum action alternative would be Alternative 4: Plow road on trial basis for 3-5 years beginning in mid-February. Alternative 4 may further the purposes for which the Park was established, “as a public park for the benefit and enjoyment of the people” and “as a game refuge...” (39 Statue 938) by increasing opportunities for winter recreation. In addition, Alternative 4 outlines actions on a trial basis providing flexibility to quickly address resource impacts associated with visitor use and impacts to Park operations. Alternative 4 is not necessary in the Denali Wilderness but could be undertaken if the benefits to the wilderness character are enhanced. Alternative #4 shows a positive impact to the Park’s unique/other features, of scenic viewing, with no impacts to the other wilderness character qualities and shows the highest total scoring of the action alternative analyzed.

**Monitoring and reporting requirements:**

If the minimum action alternative is selected a program should be established to monitor visitor and commercial use patterns and associated impacts to the wilderness.

**Check any Wilderness Act Section 4(c) uses approved in this alternative:**

- |   |  |
|---|--|
| <input type="checkbox"/> mechanical transport | <input type="checkbox"/> landing of aircraft |
| <input type="checkbox"/> motorized equipment  | <input type="checkbox"/> temporary road      |
| <input type="checkbox"/> motor vehicles       | <input type="checkbox"/> structure           |
| <input type="checkbox"/> motorboats           | <input type="checkbox"/> installation        |

Record and report any authorizations of Wilderness Act Section 4(c) uses according to agency policies or guidelines.

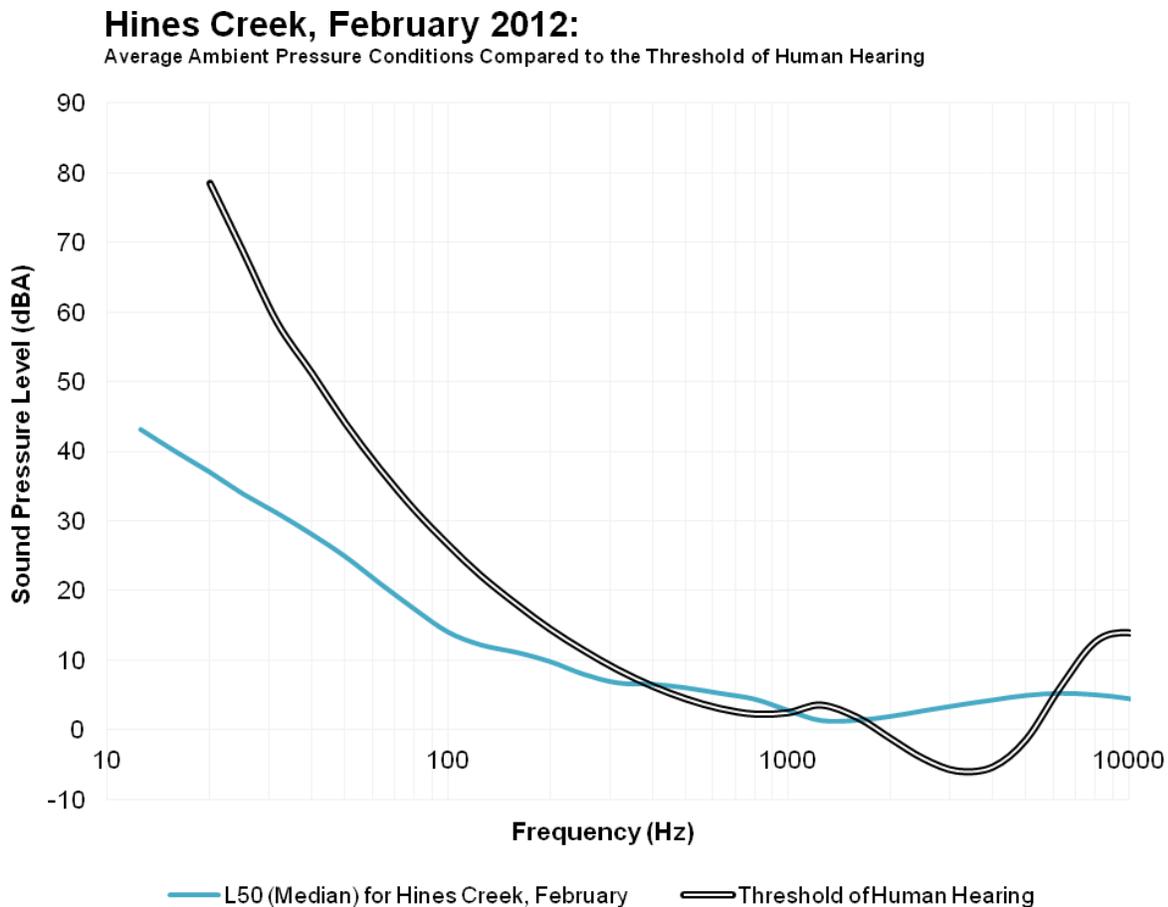
<u>Approvals</u>	Signature	Name	Position	Date
Prepared by:		J. Dan Abbe	Backcountry District Ranger & Wilderness Coordinator	
Recommended:		J. Dan Abbe	Backcountry District Ranger & Wilderness Coordinator	
Recommended:		Pete Webster	Chief Ranger	
Approved:			Superintendent	

## APPENDIX D: Soundscape Information

### Observed Natural Acoustic Conditions:

Average conditions of ambient pressure energy at the Hines Creek site during February 2012 were the lowest recorded thus far in any area of Denali National Park and Preserve. The median sound pressure level, L50, was 17.4 dBA (A-weighted decibels) during the sampling period. The following graph shows L50 for each 1/3<sup>rd</sup> octave band as compared to the threshold of human hearing (ISO 226:2003). The majority of audible acoustic energy during the deep winter is due to the motion of air through vegetation (especially spruce needles) and over snow. The energies of this motion are apparent in the bands between 1000 and 10000 Hertz (Hz).

Soundscape modeling for Hines Creek. Median ambient sound pressure level (L50) for each third octave band as compared to the threshold of human hearing.



### Estimate of Noise-Affected Area:

A basic estimate of the area over which a sound may be audible can be conducted from three inputs: the acoustic features of the sound source, the natural acoustic conditions of the environment, and the location of an observer. In this section, the input parameters for the area surrounding the Park Road are determined.

## 1. Source

Using acoustic measurements along the Park Road corridor (current Denali soundscape monitoring data, 2012) it was determined that the amount of sound power radiated by a personal vehicle was normally-distributed around 95 dBA, with the majority of traffic radiating between 90 and 100 dBA. Larger vehicles, such as buses or road maintenance equipment, radiate energy over a wider range of magnitudes with an average closer to 105 dBA.

An isotropic source is one that radiates energy equally in all directions. Close to a hard surface, an isotropic source radiates sound energy in a hemispherical pattern. Although some vehicles may radiate energy directionally, most radiate isotropically – an approximation that will be used for the source in this estimate as well.

## 2. Environment / Path

Vehicles on the Park Road radiate the majority of their acoustic energy in the bands between 100 and 1000 Hertz (current Denali soundscape monitoring data, 2011.) As the magnitude of natural energy in these bands is not sufficient to mask the noise, it follows that audibility at distance will usually be limited by the threshold of human hearing and not by masking. This factor greatly simplifies the calculation of audible distance, in that the threshold of human hearing can be used to describe the limit of audibility at any time.

The absorption of sound energy by molecules in the air is also an important attenuation factor over large distances. For the average temperature of -4.4 °C and average relative humidity of 75.6%, the expected molecular absorption coefficient in the critical band from 100 to 1000 Hz is about 0.2 decibels per 1000 feet. (SAE, 1975.)

## 3. Observer

The purpose of this estimate is to understand the potential to experience the solitude of wilderness. Therefore, observers are considered to be still (not generating their own noise) and actively listening, as they might be when enjoying the silence of the winter landscape.

### Calculation:

Given the Sound Power Level of a vehicle and the Sound Pressure Level required for a sound to be audible, the distance at which a sound becomes inaudible can be calculated from the following equation:

$$L_w = L_p - 10 \log_{10} \left( \frac{1}{2\pi r^2} \right)$$

where

$L_w$  = Sound Power Level

$L_p$  = Sound Pressure Level

r = distance at which the  $L_p$  is measured

For the sake of this estimate,  $L_w$  will be set to 90 dBA, 95 dBA, 100 dBA, and 105 dBA – typical power levels of different vehicles on the road.  $L_p$  will be set equal to the average threshold of human hearing in the critical band from 100 to 1000 Hertz. Because the sound level meter can only measure sound pressure level accurate to  $\pm 0.7$  dBA, a range of distances will be reported for each power level.

## APPENDIX E – Cost Estimates

### Startup costs for Alternative 2, 3 and 4

Division	Alternative Components	Alt 2 cost	Alt 3 cost	Alt 4 cost
<b>Roads</b>	Equipment	52,000	52,000	0
<b>Buildings/Utilities</b>	Warming shelter	15,000	0	0
<b>Trails</b>	Labor for 6-person crew for 4 weeks	26,000	18,000	0
	SAGA Crew Clear Brush and Repair Surface	32,000	32,000	0
	Fleet cost for 6-person crew	2,000	2,000	0
	Tools and Materials	3,000	1,000	0
<b>Information Technology</b>	Cost for communication device	10,000	10,000	0
<b>Kennels</b>	Truck, Trailer (need safer configuration)	20,000	20,000	0
	<b>Total Startup Cost</b>	<b>160,000</b>	<b>135,000</b>	<b>0</b>

## Annual costs for Alternatives 2, 3 and 4

Division	Alternative 2 Component	Alt 2 cost	Alternative 3 Component	Alt 3 cost	Alternative 4 Component	Alt 4 Cost
<b>Roads</b>	2 Equipment Operators,1 Laborer	136,000	1 Equipment Operator, 1 Laborer	80,500	No additional staffing	0
	Equipment: Wear edges at 3.5 times current annual expense for mile 1-3	39,900	65% of full winter plowing	25,900	3 sets of cutting edges	4,800
	Fuel (2000 gallons), sand (400 yards), grader chains (1.5 sets)	49,000	65% of full winter plowing	31,850	Fuel (640 gallons), sand (100 yards)	6,825
	Steam culverts Feb-Mar, 60 days 2 employees w/steam truck	60,000	Steam culverts Feb-Mar, 60 days 2 employees w/steam truck	60,000	No additional staffing	0
	Increased amortization rate (due to increased use/shorter life span) for grader(35K/yr), plow truck(15K/yr), steam truck(15k/yr)	65,000	Increased amortization rate	42,250	Road grader and Sand truck use (pay flat rate only with no amortization taken into account)	10,150
<b>Building/ Utilities</b>	1 janitorial worker 7 days/week, Oct – Mar	20,000	0.4 time janitorial worker 7 days/week, Jan–Mar)	8,000	Janitorial Services covered under regular operations	0
	Janitorial for toilets, Warming hut supplies and additional pumping	7,000	Janitorial supplies for toilets, additional pumping	3,000	Janitorial supplies for toilets, additional pumping	2,000
<b>Trails</b>	Trail grooming RCCG October – March, 1 Equipment Operator w/grooming equipment	60,000	None	0	None	0
<b>Information Technology</b>	Routine maintenance of batteries, equipment (emergency communications)	3,000	Routine maintenance of batteries, equipment (emergency communications)	3,000	None	0
<b>Law Enforcement</b>	Patrol road 3/day – 7 days per week – 180 days = 10,000 miles @ .42/mile	4,200	Patrol road 3/day – 7 days per week – 90 days = 5,000 miles @ .42/mile	2,100	Patrol road 3/day – 7 days per week – 60 days =3,400 miles @ .42/mile	1,428
<b>Kennels</b>	Additional winter staff (GS-5) or overtime for dog handling/ transport Oct-Dec when dogs will due to loss of use of Park Road	21,200	Only staff needed for dog demo's	0	Amenity Fee will cover expense if needed	0
	Fuel, extra 1000 miles per season	420	Fuel, extra 500 miles per season	210	Amenity Fee will cover expense if needed	0
	2 GS-05 October – March, daily dog demonstrations 5 times per week	45,000	2 GS-05 January – March, daily dog demonstrations 5 times per week	32,000	Amenity Fee will cover expense if needed	0
	Housing for winter seasonals (9 units), 500/month utilities	27,000	Housing for winter seasonals (7 units) 500/month utilities	12,000	Amenity Fee will cover expense if needed	0
	<b>Total yearly cost for Alt 2</b>	<b>537,720</b>	<b>Total yearly cost for Alt 3</b>	<b>300,810</b>	<b>Total yearly cost for Alt 4</b>	<b>25,203</b>