

**Final
Development Concept Plan
Environmental Impact Statement**
Volume 1

South Side
DENALI
Alaska

National Park Service
State of Alaska
Denali Borough
Matanuska-Susitna Borough
Ahtna, Incorporated
Cook Inlet Region, Incorporated

Final Development Concept Plan Environmental Impact Statement

South Side **Denali** Alaska

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This *Final Development Concept Plan/Environmental Impact Statement* describes the proposed action and two other action alternatives for providing opportunities for high quality, resource-based, destination experiences on the south side, as well as information, orientation, and recreation services and facilities convenient to park visitors. A no-action alternative is also described. Under all alternatives, facilities and access would be developed in a location and manner that minimizes impacts on resources, local lifestyles, and communities. The proposed action and alternatives were fully examined in the *Revised Draft Development Concept Plan/Environmental Impact Statement* released in March 1996. The proposed action presents a long-term vision for visitor developments on the south side. Critical to the implementation of this or other action alternatives would be the development of a logical and cost-effective phasing scenario, which would be developed in detail during plan implementation. The proposed action includes construction of a visitor center, campsites, a picnic area, public use cabins, and some hiking/interpretive trails in the Tokositna area of Denali State Park. In cooperation and, where desirable, a partnership between the National Park Service, local communities, Native corporations, and the state of Alaska would develop visitor facilities and services at Talkeetna, Broad Pass, and in the central development zone of Denali State Park when need and opportunity to do so are established. Consultation and coordination with local communities to define need and determine appropriate courses of action would be essential. For the state park central development zone, this would entail constructing a visitor center. The Byers Lake campground would be expanded or a new campground would be built elsewhere in the central development zone. Primitive fly-in only campsites would be constructed at Chelatna Lake, as would public use cabins and a hiking/interpretive trail and trailhead sign. The Dunkle Hills road could provide new public access opportunities in the Dunkle Hills/Broad Pass area, including improved access into Denali National Park and Preserve, pending resolution of land status/access issues.

This document is the result of a collaborative process that takes a regional rather than a jurisdictional approach to planning. The cooperative planning partners are comprised of representatives from the National Park Service, the state of Alaska, Denali Borough, Matanuska-Susitna Borough, and two Native regional corporations (Ahtna, Inc., and Cook Inlet Region, Inc.). All six partners in this cooperative effort have land management authorities on the south side. In compliance with the National Environmental Policy Act of 1969, as amended, the National Park Service is the lead federal agency responsible for this environmental impact statement; the state and the two boroughs are cooperating agencies. The two Native corporations may not serve as cooperating agencies under the National Environmental Policy Act, but are considered planning partners in accordance with National Park Service guidelines and the Federal Advisory Committee Act.

No action may be taken until at least 30 days after the Environmental Protection Agency has accepted the document and published a notice of availability in the *Federal Register*.

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SUMMARY

INTRODUCTION

In 1993 the National Park Service (NPS) published a *Draft Development Concept Plan/Environmental Impact Statement* (DCP/EIS) that proposed several south side developments. For the purposes of this plan, the south side is defined to include the 1980 ANILCA addition on the south side of Denali National Park and Preserve; Denali State Park; lands extending south to include Chelatna Lake, the Petersville Road area, and Talkeetna; and the road/rail corridor as far north as Cantwell (see the Existing Conditions/Project Area map in the “Purpose and Need” section).

While there has been a generally shared vision among public land managers in the region and others that the south side of Denali should receive greater use and development for visitors, the size and location of facilities have generated extensive public controversy for many years. Unfortunately, the 1993 draft plan did not resolve the controversy and, in 1994, Secretary of the Interior Bruce Babbitt established a task force to make recommendations on, among other matters, the cooperative management and recreation development of Denali south side. The Denali Task Force submitted its final report to the National Park System Advisory Board in December 1994; the report’s recommendations for the south side were adopted by the advisory board without modification.

Since completion of the task force report, south side planning has been reinitiated as a cooperative project by intergovernmental planning partners. This *Final Development Concept Plan/Environmental Impact Statement* is one component of this cooperative endeavor. The cooperative planning partners are comprised of representatives from the National Park Service, state of Alaska, Denali Borough, Matanuska-Susitna Borough, and two Native regional corporations (Ahtna, Inc., and Cook Inlet Region, Inc.). In compliance with the National

Environmental Policy Act of 1969, as amended, the National Park Service is the lead federal agency responsible for this document; the state and the two boroughs are cooperating agencies. The two Native corporations may not serve as cooperating agencies under the National Environmental Protection Act, but are considered planning partners in accordance with NPS guidelines and the Federal Advisory Committee Act.

The purpose of this *Final Development Concept Plan/Environmental Impact Statement* is to identify and evaluate options for the south side of Denali that serve the following vision:

- Provide opportunities for high quality, resource-based, destination experiences and provide information, orientation, and recreation services and facilities convenient to park visitors.
- Develop facilities and access in a location and manner that minimizes impacts on resources, local lifestyles, and communities.
- Establish working partnerships for funding and phasing development as outlined in the concept plan.

In addition, the cooperative planning partners have identified a number of more specific goals:

- Provide access to and a location for interpretation of the special qualities found in Denali National Park and Preserve and Denali State Park, including access to the spectacular alpine landscape on the south side of the Alaska Range.
- Offer a range of experiences and opportunities to meet the diverse needs of the traveling public, including information and orientation to the region; new or improved recreation facilities; enhanced state and national park interpretation; and shelter in bad weather.

SUMMARY

- Ensure that, viewed as a whole, facilities and services benefit all visitors, including Alaska residents, independent travelers, and package tour travelers.
- Design and develop facilities and access improvements to support public use and understanding of the south side and its outstanding resources.
- Establish a research program and identify management needs to guide facility and road development.
- Facilitate orderly economic development in the region consistent with resource protection.
- Minimize and mitigate adverse effects on fish and wildlife resources, habitat, cultural resources, local rural quality of life, and existing public land and resource uses, including subsistence uses.
- Establish methods, responsibilities, and necessary steps to control unwanted secondary impacts of tourism and to minimize conflicts between different visitor groups.

This environmental impact statement evaluates the impacts of the proposed action and a range of alternatives, including a no-action alternative. This document also sets the stage for establishing working partnerships for more detailed decision-making, funding, and phasing of appropriate visitor facilities and services on the south side of the Alaska Range.

Several issues were identified during scoping for this document, including potential effects on wildlife; fish; vegetation; threatened, endangered, or sensitive species; air and water quality; cultural resources; local communities; minority and low-income populations and communities; land use; subsistence; and visitor activities. These issues, as well as local, state, and federal laws, orders, regulations, and policies, form the basis for the environmental analysis in this document.

CHANGES MADE BETWEEN THE REVISED DRAFT AND FINAL DEVELOPMENT CONCEPT PLAN / ENVIRONMENTAL IMPACT STATEMENT

In response to public comments and cooperative planning partner discussions, several changes have been made between publication of the revised draft DCP/EIS and completion of the final DCP/EIS. The major changes are summarized here.

Purpose and Need – This section was updated to more explicitly describe the partners’ vision for south side development and recreational opportunities and to state the need for visitor facilities and services more clearly.

Direction for the Plan – This section was modified to clearly state the vision, goals, and objectives that guide this plan.

Elements Common to All Action Alternatives – Additional detail has been provided clarifying the general policies and actions that would be implemented under each action alternative and the no-action alternative. For example, additional text is included to emphasize partner support of continued mining in the study area.

Implementation of the Development Concept Plan – This section was revised to provide clarification and additional information about plan implementation, including collective and individual partner commitments to ensure continued partnership, continued and strengthened public consultation and involvement, coordination on related plans, and appropriate measures to minimize or avoid adverse impacts.

Two key commitments added are as follows:

- Ensure that additional or revised land management plans and controls are in effect before major development occurs.

- Assess the progress of plan implementation after three years in light of funding availability, results of wildlife research, and progress on identified mitigation strategies, and adjust priorities or management emphasis as needed.

Alternatives, Including the Proposed Action

– The proposed action has been revised based on public input and cooperative planning partner discussions. Language has been added to clarify the objectives for development in the Tokositna area and along the George Parks Highway. The size of the Tokositna visitor center has been reduced from a maximum of 13,000 square feet to a maximum of 5,000 square feet, with associated changes in visitor center functions and reductions in visitor and administrative space, parking, and employee housing. The capacity of the picnic facility in the vicinity of the Tokositna visitor center has been increased from 25 to 50 people and now includes uncovered as well as covered areas for tables.

The proposed action also now concentrates on an upgrade and extension of the Petersville Road only from the Forks Roadhouse (mile 19) to the Tokositna site, because the road is generally usable for recreation development in its current state to mile 19, and it is assumed that the first 19 miles would be maintained and upgraded by the state regardless of actions proposed by this DCP/EIS. The road would also now include appropriately sited bicycle and pedestrian enhancements (not included in the revised draft DCP/EIS).

Statements have been added noting that the visitor centers and public use cabins would be designed and built for year-round use (though, initially, only a portion of the Tokositna visitor center would be open to the public in the winter).

The need for phasing and funding strategies are reemphasized, but most details regarding phasing of proposed developments have been removed from the text; these would be

determined during subsequent implementation planning activities.

The no-action alternative (alternative C) has been revised slightly in that the proposed Matanuska-Susitna Borough development of a snowmachine user facility near the Forks Roadhouse on the Petersville Road has been corrected to show only a parking area and sanitary facilities. The trail to the Chulitna River is described in more detail and the location changed from the central development zone to the southern development zone of Denali State Park. Construction of four public use cabins on the east side of the Chulitna River in Denali State Park also has been added to the list of actions.

The mitigating measure related to regulating motorized activities on the Curry-Kesugi Ridge and in the Troublesome Creek drainage of Denali State Park has been deleted.

Affected Environment – This section has been revised and updated to reflect new information received since the revised draft DCP/EIS was published and to better describe some resource conditions to address questions raised through public comments on the revised draft DCP/EIS.

Environmental Consequences – The impact sections for each of the development alternatives have been revised to reflect changes made to the proposed action and no-action alternatives. Additionally, the impact analyses for all alternatives assume land use controls would be in place prior to major development; however, where it makes a difference in the analysis, a description of the impacts is provided given the situation that these controls are not implemented. Visitation predictions under all alternatives except alternative B have been reduced and relevant impact sections rewritten accordingly. Completion of visitor center facilities would not occur prior to year 2000 as assumed in the revised draft; this is now assumed to take place no sooner than 2002 in the final DCP/EIS.

PROPOSED ACTION AND ALTERNATIVES

The proposed action is based on south side recommendations made by the Denali Task Force, with modifications made by the cooperative planning partners based on additional public input and environmental and economic considerations. Other sections of this final DCP/EIS, including alternatives to the proposed action, are based on the 1993 draft DCP/EIS, also with modifications made in response to public comments and resource considerations.

Several general policies and actions would be implemented under each action alternative.¹ The policies would call for locating commercial facilities primarily on private lands; protecting the wild character of the south side; minimizing impacts on existing uses; adhering to the Alaska National Interest Lands Conservation Act (ANILCA), sections 1306 and 1307; and phasing development.

The following actions would be taken:

- developing up to two additional roadside exhibits along the George Parks Highway
- identifying and establishing watchable wildlife areas
- developing self-guiding interpretive brochures
- managing state rights-of-way to maintain safety and protect scenic values including selective brushing along the George Parks Highway
- reviewing and revising the Matanuska-Susitna Borough’s Special Land Use District in Denali State Park to improve implementation and enforcement*
- completing borough corridor management plans for the Petersville Road and portions of the George Parks Highway*
- working together as appropriate, to manage recreational activities and other uses of public lands on the south side* (In the no-action alternative, such efforts would

continue, but would be less comprehensive and lower priority.)

- supporting the maintenance of mining activities and working with the mining industry and individual claim holders to address mining issues in the project area*
- considering state scenic byway designation for portions of the George Parks Highway, including the section in Denali State Park*
- conducting research on the natural and cultural resources and human uses in the area in advance of development, as appropriate, on the south side* (In the no-action alternative, general information gathering would continue, but not at the pace, depth, or level of funding that would be anticipated if the site-specific developments described for the action alternatives were to be implemented, especially those along the Petersville Road.)
- formally establishing a Denali South Side Plan Implementation Partnership to continue the cooperative partnership approach in implementing the development concept plan

Proposed Action (Regional Strategy)

1. An asterisk (*) indicates those actions that would also apply under the no-action alternative.

Major facilities would be split between the George Parks Highway and Tokositna to provide a broad range of visitor opportunities. A visitor center (up to 5,000 square feet) would be built in the Tokositna area of Denali State Park. The Petersville Road would be upgraded and extended from the Forks Roadhouse (about mile 19) to access this new facility. Up to 50 primitive recreational vehicle (RV) or tent campsites, a picnic area, up to four public use cabins, and some short hiking/interpretive trails (some leading into Denali National Park and Preserve) would also be developed in the Tokositna area. In cooperation and, where desirable, a partnership between the National Park Service, local communities, Alaska Native Claims Settlement Act (ANCSA) Native corporations, and the state of Alaska would develop visitor facilities and services at Talkeetna, Broad Pass, and in the central development zone of Denali State Park when the need and opportunity to do so are established. Consultation and coordination with local communities to define need and determine appropriate courses of action would be essential. For the central development zone this would entail constructing a visitor center (up to 3,000 square feet). The Byers Lake campground would be expanded by up to 25 sites or a new campground of up to 50 sites would be built elsewhere in the central development zone. Up to five primitive fly-in only campsites would be constructed at Chelatna Lake, as would up to two public use cabins and a hiking/interpretive trail and trailhead sign. The Dunkle Hills road could provide new public access opportunities in the Dunkle Hills/Broad Pass area, including access into Denali National Park and Preserve, pending resolution of land status/access issues.

Development would occur under a logical and cost-effective phasing scenario developed by the Denali south side planning partnership, in consultation with the public.

Alternative A (Large-Scale Visitor Facility along the George Parks Highway)

All facilities would be located in Denali State Park along the George Parks Highway. No facilities would be constructed in the Tokositna area, in the Dunkle Hills, or near Chelatna Lake. The Petersville Road would not be upgraded or extended beyond mile 19 under this alternative. One visitor center (up to 13,000 square feet) would be built in either the northern, central, or southern development zone of Denali State Park. The Byers Lake campground would be expanded by up to 25 sites or a new campground of up to 50 sites would be built elsewhere in the central development zone. Short hiking/interpretive trails would be developed around the visitor center. No public use cabins would be constructed.

Alternative B (Small-Scale Visitor Facility along the George Parks Highway)

Under alternative B, all facilities would be located in Denali State Park along the George Parks Highway. No facilities would be constructed in the Tokositna area, in the Dunkle Hills, or near Chelatna Lake. The Petersville Road would not be upgraded or extended beyond mile 19 under this alternative. One small visitor center (up to 1,500 square feet) would be built in either the northern, central, or southern development zone of Denali State Park. A small campground (up to 25 sites) would be constructed in the central development zone along the George Parks Highway. Short hiking/interpretive trails would be developed near the visitor center. No public use cabins would be constructed.

Alternative C (No Action)

Management activity and the current low level of backcountry visitation would continue. Under alternative C, all facilities would be located in Denali State Park along the George Parks Highway. No facilities would be constructed in the Tokositna area, in the Dunkle Hills, or near Chelatna Lake. The Petersville Road would not be upgraded or extended beyond mile 19 under

SUMMARY

this alternative. A 320-square-foot visitor contact station would be built near the Alaska Veterans Memorial in the central development zone of Denali State Park. A short trail to the Chulitna River would be developed in the southern development zone of the state park. The Matanuska-Susitna Borough would likely construct a snowmachine user parking area and associated sanitary facilities near the Forks Roadhouse along the Petersville Road. An existing privately built (trespass) cabin near Chelatna Lake would be converted to public use. In addition, four public use cabins may be constructed. An estimated 143 to 217 acres of vegetation would be lost or disturbed as a result of construction of the proposed developments. Increased development and use on the south side would also cause an additional unknown amount of vegetation disturbance or loss through brushing and vista clearing, the development of user-made trails and informal campsites, and due to increased off-road vehicle (ORV) use and spin-off development of other lands. Considering that the vegetation classes extend over several million acres in the planning area, and the commitment to avoid, wherever possible, construction in sensitive areas like wetlands, the loss of this acreage is not considered a significant impact on vegetation.

From 127 to 167 acres of prime grizzly habitat and from 16 to 50 acres of general grizzly habitat would be lost or disturbed. The entire 143 to 217 acres would also be considered a loss of general black bear habitat. Bears could also indirectly lose habitat if they are displaced due to proposed actions. Due to the widespread availability of bear habitat within the region, the loss of this amount of habitat is not expected to substantially impact bear populations. Increased human presence in the area could also lead to more frequent bear/human confrontations and contribute to higher levels of bear mortality, adversely impacting individual bears, but not significantly impacting the regional bear population. Measures would be taken to minimize these impacts.

Loss of caribou habitat due to the proposed action would be minimal (about ½ acre). An

developed on the east side of the Chulitna River in Denali State Park. Development of campgrounds or other visitor facilities on the south side would not be anticipated by the state, the National Park Service, or the boroughs.

ENVIRONMENTAL CONSEQUENCES

Impacts of the Proposed Action

unknown amount of habitat could be lost due to spin-off development on the south side. At current population levels, impacts on caribou from recreational use of the Dunkle Hills area would be minimal because recreation access and use of the Cantwell calving grounds in May would be limited by snow conditions and calving in this area is low. In addition, caribou do not generally use the Dunkle Hills area during the peak summer recreation season. In the fall and winter, though caribou may be adversely impacted by increased recreational and subsistence use, no long-term impacts on populations would be expected. However, at historic caribou population levels, with large numbers of animals using the grounds, a concurrent increase in human use of the Dunkle Hills area could raise the potential for human/caribou interactions, thus increasing the frequency of caribou disturbance by humans, which could cause displacement of caribou. Management actions could minimize or prevent these impacts.

From 143 to 217 acres of general and winter moose habitat, including from 122 to 162 acres of critical winter range, would be lost or disturbed under the proposed action. An unknown amount of habitat could be lost due to spin-off development on the south side. Moose could also indirectly lose habitat if they are displaced due to proposed actions. This loss of habitat would not be expected to impact the moose population because moose habitat is abundant in the area. Improved access along the Petersville Road could increase hunting pressure in an area that is already heavily hunted.

Improved access along the Dunkle Hills road area would increase nonsubsistence and subsistence hunting pressure in this area. Increased human use of the south side could lead to more frequent incidents of moose harassment, resulting in stress on individual animals, but probably not significantly affecting the regional moose population.

From 143 to 217 acres of wolf habitat would be lost or disturbed due to facility siting. An unknown amount of habitat could be lost due to spin-off development on the south side. This loss of habitat would have little direct impact on wolf populations in the area. If wolves are forced to abandon certain areas due to human use, the proposed action would lead to an increased number of anglers using local streams, potentially adversely impacting the aesthetic experience of fishing for some people; however, fish populations would not be directly impacted by increased visitation, due to expected adjustments in seasons and catch limits by the state. Fish populations may be impacted indirectly through degradation of habitat associated with facility siting, spin-off development, and increased recreational use of the area. The precise level of impact on fish habitat would be determined when site-specific location and design details for the proposed facilities are developed; however, measures would be taken to ensure that impacts remain minimal.

The American peregrine falcon is the only federally endangered species that may occur on the south side. Several federal and state species of concern may be present, as well. Surveys conducted as part of subsequent environmental analysis would determine for certain whether these species inhabit the study area. Consultation with the U.S. Fish and Wildlife Service regarding such species would continue. Measures developed as part of this consultation would ensure that any of these species found to occur in the study area would not be affected by the proposed action. Therefore, under this proposal, no impacts would be expected on listed species or species of concern.

use, this indirect impact would be greater on wolves than the direct loss of habitat. However, such indirect impacts would not be expected to affect regional wolf populations significantly.

The development of recreation facilities and increased visitor use in the Tokositna area, central development zone of Denali State Park, and Chelatna Lake area would not be expected to have a significant impact on trumpeter swans due to habitat avoidance and measures to minimize human interaction with swan populations. An unknown amount of habitat could be lost due to spin-off development on the south side.

An unknown amount of habitat for the Tule greater white-fronted goose, considered a species at risk by the International Waterfowl Research Bureau, may be lost due to spin-off development, although not from construction of proposed facilities themselves. Additionally, increased recreational use associated with proposed facilities may disturb the geese, possibly causing some to abandon habitat. However, measures taken as part of the proposed action would reduce or eliminate the likelihood of such disturbance.

Short-term impacts on air quality, such as dust and vehicle emissions from construction-related activities, would be intermittent and temporary, and occur during construction of each of the project phases, as well as while improved sections of the Petersville Road remain unpaved. While long-term impacts on air quality cannot be quantified at this time, it is likely that the proposed action would adversely impact air quality in the Petersville Road area to a greater extent than that which would occur if the proposed actions were not implemented. Air quality impacts from proposed developments and associated human use would likely be minor throughout the rest of the south side compared to the effects of other existing or future south side actions.

Construction and siting of visitor facilities and associated road improvements, as well as recreational use, could impact water quality by

SUMMARY

causing increases in sedimentation and turbidity, alteration of waterflow and hydropatterns, and contamination of the water with pollutants and additional nutrients. Most water quality impacts would be temporary, lasting only during construction, and these would be minimized through adherence to best construction practices. Likewise, measures would be taken to minimize any longer-term impacts on water quality.

The proposed action would not affect any known archeological sites, and if archeological resources were encountered during more detailed site planning or construction, facility relocation or mitigation would provide acceptable protection.

There would be direct and indirect benefits, mostly during summer, to Matanuska-Susitna Borough residents from improved road and park use facilities and employment and income-producing opportunities for local residents. Economic benefits would mostly accrue to residents within easy commute range or located at the sites of new facilities. There would be increased operation and maintenance costs for the improved facilities.

Population in-migration could occur as a result of increased demand for seasonal workers during construction and operations. In addition, there would be some increase in population due to private business expansion in the area as a result of the proposed action. Housing for seasonal workers might be provided in camp-like facilities (such as cabins) or group facilities (such as dormitories, kitchen and dining halls, etc). Some housing might be available from the existing housing stock, but more likely there would be a need to develop additional employee housing. The Alaska Department of Transportation and Public Facilities does not directly provide construction worker housing. However, in outlying areas, contractors typically provide RV camps built to appropriate standards for use by road construction workers.

Adverse land use effects could occur unless certain land use actions are taken by the

The proposed action would not affect any known historic resources.

The proposed action would not result in a significant restriction of subsistence users. The small acreage required for constructing facilities and hiking trails under the proposed action should not significantly impact fish and wildlife resources used for subsistence purposes and subsistence activities. The influx of visitors and the population growth in local communities may create competition for subsistence resources in the Skwentna area, adjacent game units, and Cantwell due to the Petersville Road upgrade and Tokositna development and improved access in the Dunkle Hills.

Matanuska-Susitna Borough and other transportation corridor protections are instituted by the state of Alaska and the borough with the active participation of the local community. In addition, borough land disposal programs could include conveyance restrictions. Municipal service impacts would likely be adverse; ambulance and fire protection services would need to be upgraded and developed. Quality of life changes would be positive for those interested in increased availability of local jobs and earnings. For those interested in maintaining a sense of remoteness and a quite rural atmosphere, the perception may be of a degraded quality of life. Residents of south-central Alaska would benefit from improved access for recreational purposes.

Local Trapper Creek and Petersville residents would benefit from better park facilities and enhanced economic opportunities. The analysis assumes sufficient land use controls would be in place prior to major development to minimize undesirable strip development. There may be impacts on the quality of the backcountry experience of both local residents and visitors, due to enhanced access and slightly expanded use, particularly during winter; possible loss of the sense of remoteness and natural qualities that are important for existing residents and others who come to the area; possible loss of the rural community atmosphere and lifestyle; and

possible increased demand for municipal facilities and services, especially fire and ambulance services.

Overall, since no south side facilities are proposed for Talkeetna, adverse impacts would be minimal and concentrated during the summer. Talkeetna residents would experience additional job and income-producing opportunities associated with general regional increases in visitation under the proposed action, mostly during summer. Municipal services would be impacted slightly. Minimal impacts would be expected on land use and quality of life. Along with baseline growth, some increased summer traffic and pedestrian Minimal socioeconomic impacts would be anticipated in the Cantwell area from the proposed action, mostly because of the relatively long distances between the community and the Tokositna area of Denali State Park. Some small but relatively important employment opportunities would be created as a result of additional use and development in other areas of the south side, such as the small visitor center along the George Parks Highway in Denali State Park. Some indirect effects could result from increased visitor expenditures as visitors pass through the Cantwell area on their way to other destinations.

Opportunities for visitation to the south side would be enhanced and expanded. First-time visitors, those traveling in organized tours or as family groups, and Alaska residents would have increased recreational and interpretive opportunities. As a result of the proposed action, potential increased development on private lands, especially along the Petersville Road between Trapper Creek and the Forks Roadhouse (at about mile 19), might impact the visual and aesthetic quality of a portion of the road corridor. Upgrading the Petersville Road would improve access and result in increases in other recreational uses, although the road would not be maintained beyond the Forks Roadhouse in winter.

Residents from south-central Alaska would benefit from improved access to the area. There

congestion at private and public facilities would likely result.

Some small, but important long-term, regional employment opportunities would be created in the Denali Borough as a result of additional use and development on the south side of Denali, such as the small visitor center in Denali State Park and improved access to the Dunkle Hills. Some indirect benefits would be likely for merchants supplying goods and services to visitors in the area. There would be increased traffic and economic activity associated with tourism, with associated impacts on the rural community lifestyle.

would be increased congestion and accidents from increased vehicle traffic, particularly between the George Parks Highway cutoff and mile 19 (Forks Roadhouse) on the Petersville Road, and noise associated with increased snowmachine use in the area.

Increased hunting and fishing pressure could also lead to reductions in seasons and bag limits by the state, which could also contribute to displacement of use. The Alaska Boards of Game and Fisheries would continue to manage hunting and fishing to maintain healthy fish and wildlife populations. In addition, public safety concerns in the immediate vicinity of visitor centers, campground, and trailheads could lead to small areas being closed to the discharge of firearms. Establishment of a few discreet watchable wildlife areas along the Petersville Road or George Parks Highway could also lead to small hunting closures by the Alaska Board of Game following public involvement. In general, however, hunting would remain an important activity through the south side on state and borough lands.

Impacts of Alternative A

The types of impacts on vegetation would be the same as the proposed action, except that about 20 to 54 acres of vegetation would be lost or disturbed under this alternative.

SUMMARY

An unknown amount of vegetation, and other resources discussed below, could be lost due to spin-off development on the south side, but this amount would likely be less than under the proposed action. This same conclusion applies to other resources listed below.

From 20 to 54 acres of general grizzly bear habitat would be lost or disturbed; no prime grizzly habitat would be lost. The 20 to 54 acres would also be considered a loss of general black bear habitat. This loss would not be expected to substantially impact bear populations. The From 20 to 54 acres of general moose habitat and from 10 to 39 acres of winter range would be lost or disturbed. This loss of general and critical moose habitat associated with development and related increased human use would not be expected to impact moose populations because moose habitat is abundant throughout the south side. Increased development and human activity would cause some displacement of moose and increase the potential for incidents of moose harassment; however, the degree of impact would be less than in the proposed action because development and access would be less extensive under alternative A.

From 20 to 54 acres of wolf habitat would be lost or disturbed. Habitat loss from facility siting would have little direct impact on wolf populations in the area. Indirect loss of habitat resulting from facilities and associated human use could force wolves to abandon certain areas, but to a lesser degree than under the proposed action. However, it is unlikely that regional wolf populations would be greatly impacted.

The development of recreation facilities and increased visitor use along the George Parks Highway, primarily within Denali State Park, would not be expected to have a significant impact on trumpeter swans due to habitat avoidance and measures taken to minimize human interaction with swan populations.

This alternative would likely lead to an increase in local fishing pressure (though not as much as under the proposed action); increased fishing

potential for bear/human confrontations and bear mortality would also increase, but to a lesser degree than under the proposed action because developments would not be in prime bear habitat, nor would the level of development and access or the associated human use of the area be as extensive.

No adverse impacts on caribou populations would be expected under alternative A as no facilities would be developed in caribou habitat.

pressure on local streams, rivers, and lakes could possibly adversely affect the aesthetic experience of fishing for some people. Fish populations would not be directly impacted by increased visitation due to adjustments in seasons and catch limits as necessary by the state. Fish populations may, however, be impacted indirectly through degradation of habitat associated with facility siting and increased recreational use of the area. Again, the impact would be less than under the proposed action. The precise level of impact on fish habitat would be determined when site-specific facility design and location details for the proposed facilities are developed; however, measures would be taken to ensure that impacts remain minimal.

As under the proposed action, measures developed as part of continuing consultation with the U.S. Fish and Wildlife Service would ensure that any listed species or species of concern found to occur in the study area would not be affected by actions taken under alternative A. Therefore, under this alternative, no impacts would be expected on these species. An unknown amount of habitat for the Tule greater white-fronted goose, considered a species at risk by the International Waterfowl Research Bureau, may be lost due to spin-off development resulting from actions taken under alternative A, although not from the actual facilities constructed under this alternative. However, the amount of spin-off development, and, hence the loss of goose habitat, would not be as high under alternative A as under the proposed action. Increased recreational use

associated with proposed facilities may disturb the geese, possibly causing some to abandon habitat. However, measures would be taken to reduce or eliminate the likelihood of such disturbance.

Dust and vehicle emissions from construction-related projects would be intermittent and temporary, lasting only during construction. Compared to the proposed action, impacts on air quality of alternative A would be less, primarily because there would be less development (e.g., no Petersville Road construction) and less vehicle emissions associated with incremental increases in visitation. While long-term impacts on air quality cannot be quantified at this time, it is likely that air quality impacts under this alternative A no significant impacts would be anticipated on existing subsistence use activities or populations of fish and wildlife upon which subsistence users are dependent. Access of subsistence users to natural resources should not be affected.

There would be direct and indirect benefits to Matanuska-Susitna Borough residents from park facilities and employment and income-producing opportunities for local residents. The latter would mostly accrue to residents within easy commute range or located at the sites of new facilities. Some residents seeking a rural lifestyle may be affected by the changes.

Trapper Creek residents could realize economic benefits from the construction and operation of a visitor center in the state park. Building the visitor center in the southern or central development zone in Denali State Park could increase visitation to the community. Some Trapper Creek residents might see the increase in visitation and related employment and income as an advantage to their community. Others might see it as a decline due to the negative impacts associated with increased demand for municipal facilities and services, especially fire and ambulance services, and possible loss of the rural community atmosphere, as well as the remote, natural qualities of the area that attracted many people to live there.

alternative would be a small fraction of those resulting from other existing or future south side actions.

Alternative A would result in a temporary reduction of water quality, particularly during construction stages, but measures would be taken to minimize effects on water quality and water-dependent resources. Overall, impacts would be across a smaller area than under the proposed action and be concentrated along the George Parks Highway in Denali State Park.

Under alternative A no known archeological or historic resources would be affected (same as the proposed action).

Talkeetna residents would benefit from job and income-producing opportunities associated with increased visitation under alternative A. Municipal services would be impacted only slightly. Baseline growth is likely to cause more traffic and pedestrian congestion at private and public facilities, which could lead to loss of the rural, small community atmosphere, and alternative A would contribute some incremental growth to this.

Some small and minimal long-term employment opportunities would be created in Denali Borough as part of developing a large visitor center in Denali State Park, if the facility were located in the northern development zone. Some indirect benefits would be likely for merchants supplying visitors to a Denali State Park visitor center. Some borough residents might welcome the increased economic activity associated with increased tourism, while others might not.

Because of the distance from the identified locations for a new visitor center, the Cantwell community would likely receive only minimal direct impacts under alternative A. Some indirect benefits would be likely for merchants supplying goods and services to visitors in the area.

Opportunities for visitation to the south side would be enhanced and expanded due to

SUMMARY

development of a large visitor center along the George Parks Highway in Denali State Park, although trail access to Denali National Park and Preserve would not be achieved under this alternative. Roadside interpretive waysides, short trails, and day use facilities would also add to the south side park experience. Increased development activity might occur on private lands, although instituting stricter land use controls (assumed for each of the action proposals) would reduce potential adverse impacts on the visual and aesthetic quality of the road corridor.

From 13 to 45 acres of general grizzly and black bear habitat would be lost or disturbed as a result of facility siting. This loss is not expected to substantially impact bear populations because habitat is abundant throughout the south side. The potential for bear displacement and bear/human confrontations would be minor because facilities would be small-scale, and associated visitation would not increase significantly over current trends. Bear mortality would increase slightly, but to a lesser degree than either the proposed action or alternative A because of the lower level of access and development, as well as associated human use. Significant impacts on bear populations or habitat would be very unlikely.

No adverse impacts on caribou populations would be expected under this alternative, as no facilities would be developed in caribou habitat.

From 13 to 45 acres of general moose habitat and from 7 to 36 acres of winter range would be lost as a result of development and related human use. However, this loss would not be expected to impact moose populations because habitat is abundant throughout the south side. Indirect habitat loss due to displacement would also occur, but it would be lower than that under the proposed action and alternative A because the level of development would be smaller and more concentrated, attracting fewer visitors. Alternative B would not result in a greater potential for moose harassment or moose mortality due to hunting.

Impacts of Alternative B

Impacts on vegetation would be the same as under the proposed action, except that from 13 to 45 acres of vegetation would be lost or disturbed.

No spin-off development would be expected to result from actions taken under this alternative; therefore, there would be no related impacts on vegetation or other resources discussed below.

From 13 to 45 acres of wolf habitat would be lost or disturbed due to facility siting. Development under this alternative would be small-scale, and resulting increases in visitation to the south side would not be significantly above existing trends. The direct and indirect habitat loss from facility siting and associated human use would not significantly impact wolf populations in the area.

Development of recreation facilities would not affect trumpeter swans directly because these facilities would not be sited in sensitive swan habitat. Development would be small-scale with insignificant associated increases in visitation; therefore, no indirect impacts on swans (e.g., disturbance by people) would be expected. Additionally, measures would be taken to reduce or eliminate potential disturbance by the few people who do visit the area.

For the same reason mentioned above, there would be no impacts on local fishing pressure and only potentially minor impacts on fish populations as a result of possible habitat degradation due to facility siting.

As with the proposed action and alternative A, no impacts would be expected on listed species or species of special concern because measures would be developed in consultation with the U.S. Fish and Wildlife Service to avoid such impacts. Actions taken under alternative B would not impact the Tule greater white-fronted goose, a species considered at risk by the International Waterfowl Research Bureau, because no facilities would be constructed in

goose habitat. Additionally, increases in visitation to the south side due to actions taken under this alternative would not be significant and, thus, would not result in indirect impacts on geese such as increased disturbance by people.

Siting of visitor facilities would slightly impact air quality in the vicinity of the developments by increasing levels of pollutants (e.g., dust and vehicle emissions) in the air during construction stages. Increases in these forms of pollution would be intermittent and temporary, lasting only during construction. Visitation to the south side would not be expected to increase significantly above existing trends, nor would the corresponding traffic levels. For this reason, no long-term impacts on air quality would be expected to result from this alternative.

Alternative B may result in a temporary reduction of water quality due to siting and There would be modest direct and indirect benefits to Matanuska-Susitna Borough residents from park facilities and employment and income-producing opportunities for local residents. The latter would mostly accrue to residents within easy commute range or located at the sites of new facilities.

Trapper Creek and Talkeetna residents could modestly benefit from job and income-producing opportunities associated with constructing and operating a small visitor center under alternative B.

Minimal employment opportunities in Denali Borough would be created as part of developing a small visitor center.

Minimal employment opportunities would be created as part of developing a small visitor center in Denali State Park for which Cantwell residents might qualify. Some indirect benefits would be likely for merchants supplying visitors to the south side visitor center.

Opportunities for existing and future visitors would be expanded due to development of a small visitor center and related facilities in

construction of visitor facilities. However, these impacts would be over a smaller area than either the proposed action or alternative A. Impacts related to human use would likely be minimal as visitation would not increase significantly above existing trends. Measures would be taken to minimize effects on water quality and water-dependent resources.

Under alternative B no known archeological or historic resources would be affected (same as the proposed action).

Under alternative B no significant impacts would be anticipated on existing subsistence use activities or populations of fish and wildlife upon which subsistence users are dependent (same as alternative A). Access of subsistence users to natural resources should not be affected.

Denali State Park, but less than for the proposed action or alternative A.

Impacts of Alternative C (No Action)

A minimal amount (about 7 acres) of vegetation would be lost or disturbed by state- and borough-constructed developments under this alternative. Considering that the vegetation classes extend over several million acres in the south side study area, the loss of this amount of vegetation is not considered a significant impact.

No spin-off development would be expected to result from actions taken under this alternative; therefore, there would be no related impacts on vegetation or other resources discussed below.

A minor amount (about 7 acres) of general grizzly and black bear habitat would be lost or disturbed under this alternative as a result of facility siting, and few if any bears would be displaced due to the loss. Bear populations would not be affected substantially because bear habitat is abundant throughout the south side and because the facilities would be small scale,

SUMMARY

attracting relatively few additional visitors to the area. The probability of bear/human confrontations and human injury would be minimal, as would the potential for poaching and harassment of bears. Bear mortality would increase slightly due to facilitated access of hunters on snowmachines during the spring hunting season.

As under alternatives A, no adverse impacts on caribou populations would result from this alternative.

About 7 acres of general and winter moose habitat would be lost or disturbed under this alternative as a result of facility siting. However, this loss would not substantially impact moose populations because such habitat is abundant throughout the south side. Displacement of moose from winter habitat and moose harassment may increase slightly above Trail development to the Chulitna River may increase local fishing pressure slightly, potentially adversely impacting the aesthetic experience of fishing for some visitors. Impacts on fish populations from habitat degradation resulting from developments under this alternative would likely be minor.

As with the action alternatives, no impacts would be expected on listed or species of special concern. Actions taken under this alternative may minimally impact the Tule greater white-fronted goose (a species considered at risk by the International Waterfowl Research Bureau), due to habitat loss and disturbance from construction of visitor facilities and associated use.

Siting of visitor facilities would slightly impact air quality in the local vicinity of the facilities by increasing levels of pollutants in the air during construction stages. Increases in these forms of pollution would be intermittent and temporary, lasting only during construction and having no long-lasting effects. Construction of a parking area near the Forks Roadhouse would likely have only minimal temporary impacts on air quality areawide, but use of the parking lot

current levels, but mortality from hunting would not be expected to be affected.

About 7 acres of wolf habitat would be lost or disturbed under alternative C. Habitat loss from actions taken under this alternative would not significantly impact wolf populations in the area. Individual wolves may be adversely affected to a small degree by increased human presence in the vicinity of the Forks Roadhouse, although again, no significant impacts on regional wolf populations would be expected.

There may be a loss of a minor amount (about 7 acres) of potential trumpeter swan habitat under this alternative depending on where facilities were sited. Indirect disturbance of swans may rise slightly due to increased human presence in the vicinity of these developments.

could have more minor localized impacts because vehicles would be concentrated there.

The types of impacts on water quality would be the same as described for the action alternatives, but the magnitude would be less. Overall, impacts on water quality would be minimal and mostly temporary, lasting during construction of visitor facilities.

There would be no impacts on any known archeological or historic sites. If archeological resources were encountered during more detailed site planning or construction, mitigation would provide for acceptable protection.

There would be no impacts on subsistence users or on subsistence resources under the no-action alternative.

There would be minimal direct and indirect income effects from increased spending on lodging, transportation, food, fuel, etc., in the Matanuska-Susitna Borough. These would be less under this alternative than the action alternatives because only minor additions to publicly provided visitor facilities or services would be developed.

There would be minimal or no economic impacts on the Denali Borough or communities therein.

Interpretive and recreational opportunities for future visitors would be similar to those at present, with a minimal number of new public facilities developed under this alternative. Of note is the Matanuska-Susitna Borough's intent to construct a parking lot at the Forks Roadhouse for snowmachine users. Visitation would be increased by these developments to some extent as well as by normal increases in Alaska population associated with economic growth and statewide increases in visitation.

CONTENTS

CONTENTS

Introduction

Background	3
Changes Made Between the Revised Draft and the Final Development Concept Plan / Environmental Impact Statement	7

Purpose of and Need for the Plan

Purpose and Need	11
Planning History for the South Side	16
Direction for the Plan	20
Guiding Vision and Goals	20
Legal Mandates, Regulatory Requirements, and Policies	20
Issues and Impact Topics	22
Implementation of the Development Concept Plan	25

Alternatives, Including the Proposed Action

Introduction	31
Formulation of the Alternatives	31
Alternatives Considered but Eliminated from Further Consideration	31
Elements Common to All Action Alternatives	33
Proposed Action (Regional Strategy)	35
General Concept	35
Phasing	35
Visitor Centers	36
Campgrounds	40
Trails	41
Public Use Cabins	42
Alternative A (Large-Scale Visitor Facility along the George Parks Highway)	43
General Concept	43
Visitor Center	43
Campgrounds	45
Trails	45
Public Use Cabins	45
Alternative B (Small-Scale Visitor Facility along the George Parks Highway)	46
General Concept	46
Visitor Center	46
Campgrounds	48
Trails	48
Public Use Cabins	48

Alternative C (No Action)	49
General Actions	49
Visitor Center	50
Campgrounds	50
Trails	50
Public Use Cabins	50
Other Recreation Developments	50
Mitigating Measures Common to All Action Alternatives	51
Required Research	51
Wildlife	51
Wetlands	52
Vegetation	52
Water Quality and Surface Water Resources	53
Soils	53
Cultural Resources	53
Sustainable Design Principles and Aesthetics	54

Affected Environment

Physical Environment	73
Physiography	73
Geology	73
Soils	74
Climate	75
Air Quality/Visibility	75
Water Resources	76
Biological Environment	79
Vegetation	79
Wildlife	80
Fish	91
Threatened, Endangered, or Sensitive Species	93
Cultural Environment	96
Archeological Resources	96
Historic Resources	97
Subsistence	99
Denali National Park and Preserve	99
State/Borough Lands in the South Side Study Area	100
Socioeconomic Environment	102
Matanuska-Susitna Borough	102
Talkeetna Community	109
Trapper Creek Community	113
Petersville Area	115
Denali Borough	116
Cantwell Community	118
Denali State Park	118
Mining and Inholdings	119
Visitor Use in the State and National Parks	120

Environmental Consequences

Impacts of the Proposed Action	129
Vegetation	129
Grizzly and Black Bears	131
Caribou	136
Moose	138
Wolves	139
Trumpeter Swans	140
Fish	140
Threatened, Endangered, or Sensitive Species	141
Air Quality	142
Water Quality	144
Archeological Resources	145
Historic Resources	145
Subsistence	146
Matanuska-Susitna Borough Economy and Social Environment	148
Trapper Creek and Petersville Economies and Social Environment	155
Talkeetna Economy and Social Environment	158
Denali Borough Economy and Social Environment	159
Cantwell Economy and Social Environment	160
Visitor Use - Denali State Park and Denali National Park and Preserve	160
Impacts If No Land Use Controls Are Implemented	162
Cumulative Impacts	163
Unavoidable Adverse Impacts, Long-Term Maintenance of the Environment, and Irretrievable or Irreversible Commitments of Resources	178
Impacts of Alternative A	179
Vegetation	179
Grizzly and Black Bears	180
Caribou	182
Moose	182
Wolves	183
Trumpeter Swans	184
Fish	184
Threatened, Endangered, or Sensitive Species	185
Air Quality	186
Water Quality	187
Archeological Resources	187
Historic Resources	187
Subsistence	188
Matanuska-Susitna Borough Economy and Social Environment	188
Trapper Creek and Petersville Economies and Social Environment	192
Talkeetna Economy and Social Environment	193
Denali Borough Economy and Social Environment	194
Cantwell Economy and Social Environment	195
Visitor Use - Denali State Park and Denali National Park and Preserve	195
Impacts If No Land Use Controls Are Implemented	196

Impacts of Alternative B	197
Vegetation	197
Grizzly and Black Bears	198
Caribou	199
Moose	199
Wolves	200
Trumpeter Swans	200
Fish	201
Threatened, Endangered, or Sensitive Species	201
Air Quality	202
Water Quality	202
Archeological Resources	203
Historic Resources	203
Subsistence	203
Matanuska-Susitna Borough Economy and Social Environment	204
Trapper Creek and Petersville Economies and Social Environment	206
Talkeetna Economy and Social Environment	207
Denali Borough Economy and Social Environment	207
Cantwell Economy and Social Environment	208
Visitor Use - Denali State Park and Denali National Park and Preserve	208
Impacts If No Land Use Controls Are Implemented	208
Impacts of Alternative C (No Action)	210
Vegetation	210
Grizzly and Black Bears	211
Caribou	212
Moose	212
Wolves	212
Trumpeter Swans	213
Fish	213
Threatened, Endangered, or Sensitive Species	214
Air Quality	214
Water Quality	214
Archeological Resources	215
Historic Resources	215
Subsistence	215
Matanuska-Susitna Borough Economy and Social Environment	215
Denali Borough Economy and Social Environment	216
Visitor Use - Denali State Park and Denali National Park and Preserve	216

Consultation and Coordination

- Consultation and Coordination for the 1993 Draft Development Concept Plan / Environmental Impact Statement, South Slope 221
- Consultation and Coordination for the 1996 Revised Draft and Final Development Concept Plan / Environmental Impact Statement, South Side 223
- List of Agencies, Organizations, and Businesses to Whom Copies of the 1993 Draft, 1996 Revised Draft, or Final Development Concept Plan / Environmental Impact Statement Were Sent 225

Appendixes / Bibliography / Preparers / Index

- Appendix A: Summary of Denali Task Force Recommendations for the South Side, 1994 229
- Appendix B: Statement of Cooperation 230
- Appendix C: Legal Mandates, Regulatory Requirements, and Policies 235
- Appendix D: ANILCA Section 810 - Subsistence Statement 239
- Appendix E: Development Cost Estimates 244
- Appendix F: Staffing, Operation, and Maintenance Cost Estimates 249
- Appendix G: ANILCA Sections 1306 and 1307 Implementation Subunit Guidelines 254
- Appendix H: Alaska Department of Fish and Game Management Subunit Boundaries 263
- Appendix I: Wildlife Habitat Maps 264
- Appendix J: Endangered Species Consultation with U.S. Fish and Wildlife Service 269
- Appendix K : Visitor Projection Methodology 272
- Appendix L: Regional Economic Impact Analysis Detail 280

Bibliography 304

Preparers 312

Index 314

MAPS

Region 5	
Existing Conditions/Project Area	13
Existing Conditions Detail – Denali State Park	14
Existing Conditions Detail – Dunkle Hills Area	15
Proposed Plan	38
Alternative A	44
Alternative B	47
Landownership – Petersville Road Area	108

TABLES

1: Summary of the Proposed Action and Alternatives	55
2: Summary of Impacts of the Proposed Action and Alternatives	59
3: Soil Associations and Limitations for Development	74
4: Stream Discharge, Suspended Sediment, and Turbidity Levels - 1995, Sampling Survey	77
5: Discharge Levels - 1989–1992, Sampling Surveys	78
6: Game Fish Species and Associated Creeks, Rivers, and Lakes	92
7: Major Resources Harvested in the South Side Study Area	101
8: Full- and Part-time Employment by Major Industry, Matanuska-Susitna Borough (1988–1993)	103
9: Denali National Park and Preserve Total Recreation Visits (1985–1994)	121
10: Vegetation Lost/Disturbed Directly by the Proposed Action	130
11: Acres of Grizzly Bear Habitat Lost - Proposed Action	133
12: Visitor Projections for the Tokositna Visitor Center –Years 2002, 2007, and 2012	150
13: Baseline and Incremental Visitation to the Proposed Talkeetna Visitor Center for Alternative A – Years 2002, 2007, and 2012	189

CONTENTS

CONTENTS

INTRODUCTION

BACKGROUND

In 1993 the National Park Service published a *Draft Development Concept Plan/Environmental Impact Statement* that proposed several south side developments, including an orientation center in Denali State Park along the George Parks Highway, scenic and interpretive waysides along the highway, public use cabins and backcountry trails, a campground in Cantwell, and a possible visitor center in Talkeetna. While there has been a generally shared vision among public land managers in the region and others that the south side of Denali should receive greater use and development for visitors, the size and location of facilities have generated extensive public controversy for many years.

Unfortunately, the 1993 draft DCP/EIS did not resolve the controversy and, in 1994, Secretary of the Interior Bruce Babbitt requested the formation of a task force to make recommendations on, among other matters, the cooperative management and recreation development of Denali's south side by federal, state, and borough governments. The Denali Task Force submitted its final report to the National Park System Advisory Board in December 1994. The advisory board accepted it with a caveat to further address north side access, which has been initiated by the National Park Service in a separate public process. The south side recommendations, which triggered the revised draft DCP/EIS, were adopted by the advisory board without modification (see appendix A for summary of the Denali Task Force recommendations).

Since completion of the task force report, south side planning has been reinitiated as a cooperative project by intergovernmental planning partners. The cooperative planning partners are comprised of representatives from the state of Alaska, National Park Service, Denali Borough, Matanuska-Susitna Borough, and two Native regional corporations (Ahtna, Inc., and Cook Inlet Region, Inc.). Governor

Tony Knowles has directed that the state take a lead role in this cooperative effort to increase recreational and tourism opportunities on the south side of Denali. This final draft DCP/EIS is one component of this cooperative endeavor. Other components include an update of the Denali State Park master plan, transportation improvements in the context of the Statewide Transportation Improvement Program, and local borough planning and associated land use actions. This effort also dovetails with the governor's plan for improved trails and recreation access for Alaska (TRAAK).

Section 1306 of the Alaska National Interest Lands Conservation Act (ANILCA) allows the National Park Service to site visitor facilities outside the boundaries, and in the vicinity of, a national park.

In compliance with the National Environmental Policy Act of 1969, as amended, the National Park Service is the lead federal agency responsible for this environmental impact statement; the state and the two boroughs are cooperating agencies. The two Native corporations may not serve as cooperating agencies under the National Environmental Policy Act, but are considered planning partners in accordance with NPS guidelines and the Federal Advisory Committee Act. All six partners in this cooperative effort have land management authorities on the south side. The proposed action in this final DCP/EIS is based on south side recommendations made by the Denali Task Force, with some modifications made by the cooperative planning partners based on additional public input, cost considerations, and impact considerations. Other sections of the DCP/EIS, including alternatives to the proposed action, are based on the 1993 draft plan, also with modifications made in response to public comments.

This final DCP/EIS is the result of a collaborative process that takes a regional rather than a jurisdictional approach to planning. Even though the plan proposes little development within the boundaries of Denali National Park and Preserve, a federal plan and environmental impact statement are nonetheless necessary because federal expenditures would be required to implement the plan, and because the developments would serve visitors to both the national and state parks. Critical to the implementation of a Denali south side plan would be the establishment of an intergovernmental

implementation team and development of a logical and cost-effective phasing scenario.

Appendix B includes the informal statement of cooperation, which was developed at the beginning of this development concept plan revision process; it highlights the roles and expectations of each cooperating partner.

INTRODUCTION

Region map

CHANGES MADE BETWEEN THE REVISED DRAFT AND FINAL DEVELOPMENT CONCEPT PLAN / ENVIRONMENTAL IMPACT STATEMENT

In response to public comments and cooperative planning partner discussions, several changes have been made between publication of the revised draft DCP/EIS and completion of the final DCP/EIS. The major changes are summarized here.

Purpose and Need – This section was updated to more explicitly describe the partners’ vision for south side development and recreational opportunities and to state the need for visitor facilities and services more clearly.

Direction for the Plan – This section was modified to clearly state the vision, goals, and objectives that guide this plan.

Elements Common to All Action Alternatives – Additional detail has been provided clarifying the general policies and actions that would be implemented under each action alternative and the no-action alternative. For example, additional text is included to emphasize partner support of continued mining in the study area.

Implementation of the Development Concept Plan – This section was revised to provide clarification and additional information about plan implementation, including collective and individual partner commitments to ensure continued partnership, continued and strengthened public consultation and involvement, coordination on related plans, and appropriate measures to minimize or avoid adverse impacts.

Two key commitments added are as follows:

- Ensure that additional or revised land management plans and controls are in effect before major development occurs.
- Assess the progress of plan implementation after three years in light of funding availability, results of wildlife research, and progress on identified mitigation strategies,

and adjust priorities or management emphasis as needed.

Alternatives, Including the Proposed Action

– The proposed action has been revised based on public input and cooperative planning partner discussions. Language has been added to clarify the objectives for development in the Tokositna area and along the George Parks Highway. The size of the Tokositna visitor center has been reduced from a maximum of 13,000 square feet to a maximum of 5,000 square feet, with associated changes in visitor center functions and reductions in visitor and administrative space, parking, and employee housing. The capacity of the picnic facility in the vicinity of the Tokositna visitor center has been increased from 25 to 50 people and now includes uncovered as well as covered areas for tables.

The proposed action also now concentrates on an upgrade and extension of the Petersville Road only from the Forks Roadhouse (mile 19) to the Tokositna site, because the road is generally usable for recreation development in its current state to mile 19 and it is assumed that the first 19 miles would be maintained and upgraded by the state regardless of actions proposed by this DCP/EIS. The road would also now include appropriately sited bicycle and pedestrian enhancements (not included in the revised draft DCP/EIS).

Statements have been added noting that the visitor centers and public use cabins would be designed and built for year-round use (though, initially, only a portion of the Tokositna visitor center would be open to the public in the winter).

The need for phasing and funding strategies are reemphasized, but most details regarding phasing of proposed developments have been removed from the text; these would be

determined during subsequent implementation planning activities.

The no-action alternative (alternative C) has been revised slightly in that the proposed Matanuska-Susitna Borough development of a snowmachine user facility near the Forks Roadhouse on the Petersville Road has been corrected to show only a parking area and sanitary facilities. The trail to the Chulitna River is described in more detail and the location changed from the central development zone to the southern development zone of Denali State Park. Construction of four public use cabins on the east side of the Chulitna River in Denali State Park also has been added to the list of actions.

The mitigating measure related to regulating motorized activities on the Curry-Kesugi Ridge and in the Troublesome Creek drainage of Denali State Park has been deleted.

Affected Environment – This section has been revised and updated to reflect new information received since the revised draft DCP/EIS was

published and to better describe some resource conditions to address questions raised through public comments on the revised draft DCP/EIS.

Environmental Consequences – The impact sections for each of the development alternatives have been revised to reflect changes made to the proposed action and no-action alternatives. Additionally, the impact analyses for all alternatives assume land use controls would be in place prior to major development; however, where it makes a difference in the analysis, a description of the impacts is provided given the situation that these controls are not implemented. Visitation predictions under all alternatives except alternative B have been reduced and relevant impact sections rewritten accordingly. Completion of visitor center facilities would not occur prior to year 2000 as assumed in the revised draft; this is now assumed to take place no sooner than 2002 in the final DCP/EIS.

PURPOSE OF AND NEED FOR THE PLAN

PURPOSE AND NEED

The purpose of this *Final Development Concept Plan/Environmental Impact Statement* is to identify and evaluate options for the south side of Denali that serve the following vision for the future:

- Opportunities for high quality, resource-based, destination experiences and information, orientation, and recreation services and facilities convenient to park visitors are provided.
- Facilities and access in a location and manner that minimizes impacts on resources, local lifestyles, and communities are developed.
- Working partnerships for funding and phasing development outlined in this concept plan are established.

This environmental impact statement, developed cooperatively between the National Park Service, the state of Alaska, the Matanuska-Susitna Borough, and the Denali Borough, evaluates the impacts of the proposed action and a range of alternatives, including a no-action alternative. This document sets the stage for establishing working partnerships for funding and phasing appropriate visitor facilities and services on the south side of the Alaska Range. This document will also serve as an amendment to the 1986 *General Management Plan* for Denali National Park and Preserve.

Most of the south side of the Alaska Range was made part of the national park system under the Alaska National Interest Lands Conservation Act (ANILCA) in 1980 or part of the state park system by the State Legislature in 1970 and 1976. For the purposes of this plan, the south side is defined to include the 1980 ANILCA addition on the south side of Denali National Park and Preserve; Denali State Park; lands

extending south to include Chelatna Lake, the Petersville Road area, and Talkeetna; and the road/rail corridor as far north as Cantwell. (See the Existing Conditions/Project Area map and the Existing Conditions Detail - Denali State Park map.)

The south side of the Alaska Range contains magnificent scenery, including views of North America's tallest peak, Mount McKinley. It also contains a range of vegetation types and wildlife. Visitors from Alaska and around the world travel through this area to view and experience the jagged, permanently snow-covered peaks; glaciers; braided rivers; rolling tundra-covered hills; forests of spruce, aspen, and birch; and the wildlife for which Alaska is famous: grizzly bear, black bear, caribou, moose, and Dall sheep.

Several previous planning efforts have recognized the need to plan for the south side in order to better serve the interests of both the public and the land managing agencies in the region (see the "Planning History for the South Side" section). However, until now the area has not been comprehensively addressed as an inter-governmental, cooperative planning effort in a long-range planning document such as this.

The need for south side visitor facilities and services is illustrated by the steady increase in visitation to the Denali region, both north and south. Bus traffic on the Denali National Park and Preserve's single developed access route is at or near capacity much of the summer, and flightseeing is increasing rapidly. Likewise, the number of users of Denali State Park has increased. Campgrounds are full, backcountry uses are on the rise, and snowmachine use is escalating. In addition, a new hotel on private lands in the state park will open in 1997.

All indicators point to continued growth and demand. The challenge lies in guiding and controlling growth by linking new recreational opportunities with actions that minimize impacts. Given the pattern of landownership on the south side, this can only be successfully achieved in a partnership effort among the major land and resource managers and with a continuing dialogue with the public.

The south side is a relatively untapped recreation resource that can provide new opportunities for the increasing number of visitors to Alaska and for Alaska residents. With

attention to appropriateness, siting and design, and control of direct and indirect impacts, development of visitor information and interpretive facilities, trails, and camping facilities along the south side would help satisfy existing and future visitors to this region.

Existing Conditions/Project Area map

Existing Conditions Detail - Denali State Park map

Existing Conditions Detail – Dunkle Hills Area map

PLANNING HISTORY FOR THE SOUTH SIDE

The state of Alaska, National Park Service, local governments, and some of the private sector have had a long-standing desire to provide expanded opportunities for recreational use and enjoyment of public lands on the south side of the Alaska Range to serve an ever-increasing number of visitors to Alaska's Denali region. This is coupled with a desire to maintain the integrity of these lands. Numerous planning efforts — some dating back more than 20 years — have concluded that new and expanded facilities and services are warranted, but seldom have specific proposals been implemented. The following is a chronologically ordered list of the most notable planning efforts and studies done for, or having information regarding, the south side to date.

1968 Program for Increasing the Contribution of Tourism to the Alaskan Economy – This report by Cresap, McCormick, and Paget, under contract to the Alaska Department of Economic Development, recommended a 300-room lodge/hotel and associated recreation facilities on Indian Ridge (also known as Chulitna Pass or High Lake) at the north end of Denali State Park.

1969 Lodging for Mount McKinley National Park - Present and Projected Requirements and its Relationship to Park Visitation, Possible Park Enlargement, and Alaska Tourism – This NPS report recommended a major park-oriented tourism complex, with a 125-room lodge in the first phase located on south Curry Ridge in Denali State Park.

1972 Development Planning for the Tokositna Area – In 1972, U.S. Senator Mike Gravel (Alaska) urged the state and the federal government to study the feasibility of locating visitor facilities on the south side of Mount McKinley. The focus of attention at that time was the southeast flank of the lower Tokositna Glacier north of the end of the Petersville Road.

In 1976 the Alaska State Legislature added 66 square miles of land southeast of the Tokositna to Denali State Park for the development of visitor facilities. This land remained the focus for planning for a visitor center/hotel through the late 1970s and early 1980s. The major problems associated with locating a visitor center on the site were its distance from the Alaska Railroad and the George Parks Highway and the numerous mining claims and mining activities in the area. Proposals to construct a major visitor center/hotel complex on this site were subsequently dropped.

1975 Denali State Park Master Plan – A lodge, visitor center, park headquarters, and downhill ski area were all facilities recommended for the Byers Lake area in this 1975 master plan. This project was let for competitive proposals and a contract was awarded. However, due in part to controversy surrounding the proposals, the successful bidder did not seriously pursue implementation.

1985 Economic Analysis, Proposed Hotel and Visitor Facility, Denali State Park, Alaska – In 1985 the National Park Service published an analysis of a visitor center/lodge complex in Denali State Park, in the south Curry Ridge area. The economic analysis was for a lodge of 150 rooms (50 each of economy, standard, and deluxe classes), food and beverage services, and gift sales. Construction and operations costs were projected, and pro forma statements were developed. Among the conclusions: there is seasonal demand for such a facility; the facility would have little or no effect on crowding on the north side; about 150 jobs would be created; and the venture would have difficulty attracting private financing and would likely require some sort of public financial incentives.

1985 Susitna Area Plan – The Alaska Department of Natural Resources (ADNR), in cooperation with the Alaska Department of Fish and Game (ADFG) and the Matanuska-Susitna Borough, completed this regional plan for general state lands and borough lands within the borough boundaries (15.8 million acres) in 1985. The plan presents goals, management guidelines, land allocations, and implementation procedures that affect major resources and types of land use (e.g., agriculture, fish and wildlife habitat, forestry, recreation, settlement). The planning area is divided into 12 subregions, which are further divided into a total of 78 management units. Each management unit has a statement of management intent, a chart listing primary and secondary land uses, prohibited land uses, and subsurface policies. There are also specific management guidelines for each management unit.

1986 General Management Plan, Denali National Park and Preserve – This document is a comprehensive plan providing general guidance for all aspects of park management, and determining the needs and general locations for facilities. In the 1986 plan, the National Park Service noted the need to develop the south side for expanded and diversified visitor use. Specifically, the plan recommended that the feasibility and environmental impacts of the following facilities and services be evaluated in a development concept plan and environmental analysis:

- a trail system near the Ruth Glacier to support day and overnight trips
- improved boat access on the Chulitna River, including the possibility of a regularly scheduled boat shuttle that would provide access from a boat launch near the George Parks Highway to a trail head in the national park on the Tokositna River
- trails connecting the area near Alder Point with a riverside trail head

- a major visitor activity center in Denali State Park on Curry Ridge in conjunction with the state of Alaska

These concepts were considered in subsequent planning efforts.

1986 South Denali Concept Proposal for Developing a Major Visitor Destination in Denali State Park on the South Side of the Alaska Range – This 1986 document was a product of the Alaska Division of Parks and Outdoor Recreation and the National Park Service. The concept proposed was a major, year-round, destination on south Curry Ridge at the south end of Denali State Park. Facilities included a visitor center, private lodging, restaurants, and other public/private tourist facilities and services. Other options replaced the Curry Ridge proposal in the 1989 *Denali State Park Master Plan* (see below).

1988 Wilderness Recommendation, Denali National Park and Preserve – In 1988, in compliance with a provision in ANILCA, the National Park Service completed an environmental impact statement that recommended 2.25 million acres of land within Denali National Park be designated as wilderness under the 1964 Wilderness Act. The U.S. Department of the Interior did not forward this recommendation to Congress. Until the department submits a formal recommendation, all planning for lands determined suitable for wilderness in the 1988 NPS study will be conducted as if the lands were designated wilderness, in accordance with NPS policy.

1989 Denali State Park Master Plan – After completion of the 1986 *General Management Plan* for Denali National Park and Preserve, the state of Alaska and the National Park Service entered into a cooperative agreement to plan for a south Denali visitor complex including a hotel and visitor center. In 1988 it was determined that the *Denali State Park Master Plan* should be updated before making any decision about the visitor complex. The National Park Service provided financial assistance to the state in this planning effort.

Completed in mid-1989, the *Denali State Park Master Plan*, as amended, proposed a number of developments within state park boundaries, ranging from hiking trails and backcountry public use cabins to a rustic backcountry lodge near the Tokositna River and a small visitor center near the Eldridge Glacier. It also evaluated 16 individual sites for a visitor center and hotel complex, ultimately identifying the northern development zone of the state park as the preferred location for a visitor center and hotel complex; major facility development on Curry Ridge was eliminated as an option due to the fragile nature of the area. Due to economic constraints and continuing controversy regarding siting of visitor centers, none of the visitor center options has been implemented. Other proposals in the plan have been implemented.

1990 Draft Environmental Assessment, Proposed Tokositna and Coffee River Area Land Exchange – In September 1990 the National Park Service completed a draft environmental assessment that evaluated a proposed land exchange with the Alaska Department of Natural Resources for the purpose of realigning the Denali National Park and Preserve boundaries with the Tokositna and Coffee Rivers. As a result of the exchange, 1823.57 acres of Denali State Park would be transferred to Denali National Park and Preserve, and 2513.73 acres of national park and preserve land would be transferred to Denali State Park. In the environmental assessment, the National Park Service concluded that the land exchange could be implemented with no significant adverse effect on natural and cultural resources and subsistence activities. In addition, there would be administrative benefits and enhanced resource management for Denali National Park and Preserve and the state of Alaska. During continuing discussions, it became apparent that the exchange would result in a net loss of national park land (as compared to preserve land), and conservation groups expressed strong opposition to the exchange. Attempts to resolve concerns were not successful, and a decision

was made not to proceed with this land exchange. A final environmental assessment was not prepared.

1991 Draft Environmental Assessment, Talkeetna Visitor Center – In March 1991 the National Park Service completed a draft environmental assessment that examined the desirability and practicability of locating a visitor center in or near Talkeetna on land owned by Cook Inlet Region, Inc. In the draft assessment, the Park Service concluded that the site appeared to meet certain desirability criteria, but that practicability could not be determined until a final agreement had been reached regarding master planning for the site and support facilities (e.g., roads, parking, and electrical, water, sewer distribution and collection) and operating cost sharing. No decision about such a visitor center was made and, therefore, a final environmental assessment and a finding of no significant impact were not prepared.

1991 Susitna Basin Recreation Rivers Management Plan – The Alaska Department of Natural Resources, in cooperation with the Alaska Department of Fish and Game and the Matanuska-Susitna Borough and with assistance from the National Park Service, adopted this plan in 1991. The plan describes how the Alaska Department of Natural Resources will manage state land and water along and within six rivers: Little Susitna, Doshka, Talkeetna, Lake, Talachulitna, and Alexander. The plan divides the six river corridors into 31 subunits. Each subunit chapter contains background information, a statement of management intent, guidelines and proposed regulations specific to the subunit, and a list of public use sites. The planning area totals about 260,000 acres. Two river corridors, Doshka and Lake, are within the south Denali region.

1993 Transportation Study, Denali National Park and Preserve – A congressionally mandated study of alternatives to improve visitor access to several parks, including Denali National Park and Preserve, was requested by

Congress in 1992. This study discusses the feasibility and cost of several options that would affect the north side of the national park and an option for an aerial tram on the south side. The study was transmitted to Congress in 1995.

Should Congress choose to direct the National **1993 Draft Development Concept**

Plan/Environmental Impact Statement, South Slope, Denali – In 1991 the National Park Service began a planning effort for the south side of Denali, which built upon the recommendations made in the 1986 *General Management Plan* and in the 1989 *Denali State Park Master Plan*. This planning effort culminated in a *Draft Development Concept Plan/Environmental Impact Statement* published in the summer of 1993. In this draft document, several south side developments were proposed, including an orientation center in the state park along the George Parks Highway, scenic and interpretive waysides along the highway, public use cabins and backcountry trails, and a campground in Cantwell. A visitor center/hotel complex in Talkeetna also was evaluated as required by a 1990 Senate Appropriations Committee Directive (see the “Legislative Mandates, Regulatory Requirements, and Policies” in appendix C).

1994 Denali Task Force Report – As has been the case with previous planning efforts for the south side, controversy surrounded the proposals outlined in the 1993 *Draft Development Concept Plan/Environmental Impact Statement*. In part to resolve this controversy, a committee was formed at the request of Secretary of the Interior Bruce Babbitt in early 1994 to make recommendations on several matters involving Denali National Park and Preserve. Regarding the south side, this subcommittee of the National Park System Advisory Board, called the Denali Task Force, was asked to make recommendations on cooperative management and recreation development on the south side by federal, state, and borough governments. The task force was comprised of 16 members and represented a broad array of interests and expertise. The task force submitted its findings, including 15

Park Service to further consider any of the identified options, an environmental impact analysis would be required prior to any decision.

recommendations specific to the south side, in a report to the National Park System Advisory Board. The south side recommendations in the task force report were accepted by the board without modification on December 14, 1995.

1995 Statement for Management, Denali National Park and Preserve – Consistent with the general management plan for the park, the statement for management provides a three- to five-year blueprint of priorities and strategies to achieve park objectives. It contains an overview of the condition of the national park and preserve and an analysis of its major management issues. Further, it outlines objectives to achieve the park purpose and comply with legislation, regulation, and policy, and presents strategies to achieve those objectives. Finally, it includes information on the park’s existing uses, regional context and adjacent land considerations, legislative and administrative requirements, desired resource conditions, and the preferred visitor experience.

The statement for management outlines the following objective for south side development:

Establish and complete within 12 months a cooperative planning effort with major landowners/managers in the region, ensuring effective dialogue with other interested parties, including the general public, so that development of the south side as a visitor destination can move forward with broad-based support. As a part of cooperative planning, evaluate the potential effects of developing visitor facilities on the south side and determine the need for and nature of additional studies of potentially affected areas, resources, and uses.

1996 Revised Draft Development Concept Plan/Environmental Impact Statement – After the 1993 *Draft Development Concept*

Plan was withdrawn and the Denali Task Force completed its recommendations, the south side partners met in early 1995 to chart a new course for south side planning. The partners agreed that a successful plan would necessitate that all major landowners and land managers work together on appropriate solutions. Participants also agreed to formally cooperate in the development of a revised DCP using the task force recommendations as a starting point. A statement of cooperation to that effect was signed by the partners which led to the development of this final *Development Concept Plan*.

DIRECTION FOR THE PLAN

GUIDING VISION AND GOALS

The following vision of the future guides this plan and any subsequent development for the south side:

- Opportunities for high quality, resource-based destination experiences and information, orientation, and recreation services and facilities convenient to park visitors are provided.
- Facilities and access in a location and manner that minimizes impacts on resources, local lifestyles, and communities are developed.
- Working partnerships for funding and phasing development outlined in this concept plan are established.

In addition, the cooperative planning partners have identified a number of more specific goals:

- Provide access to and a location for interpretation of the special qualities found in Denali National Park and Preserve and Denali State Park, including access to the spectacular alpine landscape on the south side of the Alaska Range.
- Offer a range of experiences and opportunities to meet the diverse needs of the traveling public, including information and orientation to the region; new or improved recreation facilities; enhanced state and national park interpretation; and shelter in bad weather.
- Ensure that, viewed as a whole, facilities and services benefit all visitors, including Alaska residents, independent travelers, and package tour travelers.
- Design and develop facilities and access improvements to support public use and

understanding of the south side and its outstanding resources.

- Establish a research program and identify management needs to guide facility and road development.
- Facilitate orderly economic development in the region consistent with resource protection.
- Minimize and mitigate adverse effects on fish and wildlife resources, habitat, cultural resources, local rural quality of life, and existing public land and resource uses, including subsistence uses.
- Establish methods, responsibilities, and necessary steps to control unwanted secondary impacts of tourism and to minimize conflicts between different visitor groups.

LEGAL MANDATES, REGULATORY REQUIREMENTS, AND POLICIES

Federal, state, and local legal authorities and policies that guide and provide context for this cooperative planning effort and subsequent implementation of a south side plan are listed and briefly summarized in appendix C. One federal law, the National Environmental Policy Act, provides key direction for this planning process and, thus, is described in some detail in the following paragraphs.

National Environmental Policy Act Process

The National Environmental Policy Act is a national charter for the protection of the environment. It applies to all federal projects or projects that require federal involvement. The purpose of this act is to help public officials make decisions that are based on an objective understanding of environmental consequences

and to take actions that protect, restore, and enhance the environment. To ensure compliance with this act, a specified process for the

Scoping – Scoping is designed to be an early, open, public process for determining the scope and significance of issues to be addressed in an environmental document for a proposed action. The scoping process for this development concept plan was initiated in April 1991 with publication of the “Notice of Intent” to prepare an environmental impact statement in the *Federal Register*. Subsequent scoping efforts included distribution of a letter to the public and public agencies soliciting input regarding issues and concerns about the proposed action and distribution of an alternatives workbook. Public open houses held in August 1995 and coordination with the public helped further scope the issues and alternatives for the *Revised Draft Development Concept Plan/Environmental Impact Statement* and this *Final Development Concept Plan/Environmental Impact Statement*.

Additional details about the scoping process are contained in the subsequent “Issues and Impact Topics” section and in the “Consultation and Coordination” chapter.

Draft Environmental Impact Statement – An environmental impact statement evaluates all the important environmental and social/economic impacts that may result from a proposed action. It should include a full and fair discussion of environmental impacts and inform decision-makers and the public of the reasonable alternatives that would avoid or minimize adverse impacts, or that would enhance the quality of the human environment. The draft environmental impact statement for the South Side DCP was published in June 1993.

Public Comment on the Draft Environmental Impact Statement – Following publication of the draft environmental impact statement, eight public meetings on the 1993 draft DCP/EIS were held in August and October. The closing date of the public review period was initially September, but was extended to November 1,

proposed project must be followed. The steps in this process are presented below.

1993. Verbal and written comments received were considered.

Revised Draft Environmental Impact Statement – After revision of a draft environmental impact statement, the usual procedure is to publish a final document. However, if an agency makes a substantial change to a proposed action that is relevant to environmental concerns, or if there are significant new circumstances or information relevant to environmental concerns that bear on the proposed action or its impacts, a supplemental or revised draft may be written and presented for additional public review. As a result of the formation of the Denali Task Force and, in December 1994, the task force report, the National Park Service decided there was enough new information to warrant issuing a revised draft document. A “Notice of Intent” to prepare the revised draft DCP/EIS was published in the *Federal Register* on October 25, 1995 (60 FR 54705). As noted earlier, the revised draft was completed as a cooperative, intergovernmental planning effort.

Public hearings on the revised draft were held in April 1996 in the communities of Fairbanks, Healy, Cantwell, Trapper Creek, Talkeetna, and Anchorage. An additional hearing was held in Wasilla in May 1996. Ninety-seven people testified verbally at the public hearings. The two-month public comment period, with a 15-day extension, closed on June 5, 1996, and 480 written comments were received.

Final Environmental Impact Statement and Record of Decision – Comments received through the review process have been analyzed and incorporated into this final environmental impact statement with responses, as appropriate. This final environmental document provides the basis for deciding whether or not the proposed action should be approved.

Not less than 30 days after publication of a final environmental impact statement, a decision will

PURPOSE OF AND NEED FOR THE PLAN

be made and documented in a record of decision. The record of decision for this final document will be signed by the Alaska Field Director, National Park Service, and may also be signed by the state of Alaska, the Matanuska-Susitna Borough, and the Denali Borough, cooperating agencies on the environmental impact statement. The record of decision is anticipated in February 1997.

ISSUES AND IMPACT TOPICS

The issues and impact topics identified during scoping, together with local, state, and federal laws, orders, regulations, and policies, form the basis for the environmental analysis in this document. A brief rationale is presented for each issue and topic. Issues and topics considered but not addressed in detail in this document are also identified and discussed.

ISSUES AND IMPACT TOPICS CONSIDERED

Potential Effects on Vegetation and Wildlife

Several individuals and groups indicated a potential for the proposed facilities to adversely affect vegetation and wildlife. The most frequently mentioned potentially affected wildlife were grizzly bears, wolves, caribou, moose, Dall sheep, and trumpeter swans.

Bears, Caribou, Moose, Wolves, and Trumpeter Swans. These species are present on the south side and have the potential to be affected by proposed visitor developments. All are high profile species, and state and federal laws protect/manage them. For example, the protection of grizzly bear, caribou, and moose populations and their habitats was one of the purposes for national park boundary expansion in 1980 (ANILCA, sec. 202), along with proposed visitor developments. Another major rationale for national park expansion was to encompass the range of the Denali caribou herd (NPS 1989b). The *General Management Plan* for the national park and preserve identifies the decline of the Denali caribou herd as a specific wildlife resource concern (NPS 1986b). Trumpeter swans, although currently delisted as a federally threatened species under the Endangered Species Act, are still being monitored to ensure relisting is not needed. Concern was expressed that physical developments or increased use by backcountry uses and sightseers could disturb archeological and/or historic resources. Although little or no

Potential Effects on Fish

There are important fisheries on the south side, and impacts from potential facilities and structures and increased visitor use are analyzed.

Potential Effects on Threatened, Endangered, or Sensitive Species

The Endangered Species Act requires an analysis of impacts on all federally listed threatened and endangered species, as well as species that are considered to be species of concern. One federally listed endangered species may occur on the south side — the American peregrine falcon. There are no threatened species in the south side study area. Impacts on federal species of concern are also addressed in this document, as are impacts on state-listed species of special concern. (There are no state-listed endangered species in the south side study area.)

Potential Effects on Air and Water Quality

Air and water quality could be affected by construction activities and visitor use. Because this plan does not propose detailed design specifications for facilities but, rather, proposes a general direction for visitor development on the south side, a general analysis for both of these topics is provided.

Potential Effects on Archeological and Historic Resources

archeological survey work has been done on the south side, there is some likelihood that archeological resources would be found in areas proposed for development. Three historic

resources in the area of proposed developments have been surveyed and found eligible or are nominated for inclusion on the National Register of Historic Places. These are discussed in the impacts of the alternatives. If other cultural resources are discovered during surveys prior to development, coordination and consultation with the required agencies (e.g., State Historic Preservation Office and the Advisory Council on Historic Preservation) would be undertaken, as required by law, under the National Historic Preservation Act of 1966, as amended.

Potential Effects on Subsistence

Subsistence use occurs in and adjacent to the study area. Thus, possible impacts on subsistence users and the resources they rely on are of importance and concern. These impacts are evaluated in this document. Section 810 of ANILCA and NPS policy require that proposed actions within Alaska's national parks address their potential to impact the area's legally permitted subsistence users. A section 810 statement has been prepared in conjunction with this environmental impact statement and is included as appendix D.

Potential Effects on Local Communities

NPS policy requires that the expressed interests of nearby residents be considered in planning and development of a nearby national park. Concern was expressed over the possible negative effects on local communities near a visitor center at Tokositna and/or other proposed facilities (e.g., loss of the valued rural character of the local communities and increased pressure on municipal services). Conversely, some have expressed interest in possible economic benefits to local communities from such developments.

Potential Effects on Minority and Low-Income Populations and Communities

The Department of the Interior's policy on environmental justice (Executive Order 12898, dated February 11, 1994) requires that the impacts of proposed projects on minority and low-income populations and communities be evaluated, as well as the equity of the distribution of the benefits and risks.

Potential Effects on Land Use

The area considered in this DCP/EIS crosses jurisdictional lines and encompasses varied permitted uses. Comprehensive plans and special use district ordinances have been reviewed with regard to the Matanuska-Susitna and Denali Boroughs. There are no apparent conflicts with existing land use plans.

Potential Effects on Visitor Activities

Some concern was expressed about the potential effect of new facilities on existing visitor activities on the south side, including backpacking, camping, hiking, dog mushing, skiing, snowmachining, hunting, trapping, fishing, and interpretive activities. Since the principal purpose of any development on the south side in this plan would be to serve the interests of visitors, this topic is analyzed.

Mountaineering does not occur in proximity to proposed visitor developments, and this highly specialized activity is unlikely to be affected by facilities proposed for the general visitor. However, possible trails at the end of the road could make the area more attractive for mountain climbers to participate in short weekend trips to this portion of the range. Flightseeing and nonmountaineering backcountry use might be affected and are further discussed to the extent they might be stimulated or constrained by proposed facilities and increased numbers of visitors. Regulations that apply to these activities are not within the scope of this document.

ISSUES AND IMPACT TOPICS CONSIDERED BUT NOT ADDRESSED

The issues and impact topics that follow will not be addressed further in this document. Reasons are provided for each issue/topic.

Wilderness

It is NPS policy to consider all lands that are suitable for wilderness designation as if they were designated wilderness until such time as a formal congressional determination is made. The *Environmental Impact Statement on a Wilderness Recommendation for Denali National Park and Preserve* (NPS 1988a) considered several alternatives for designation and identified a preferred alternative (alternative 2 - proposed action). However, to date, no proposal concerning new wilderness designations has been forwarded to Congress. Therefore, in accordance with the policy stated above, all NPS lands identified as suitable for wilderness are to be treated as if they were designated wilderness until a formal action on wilderness designation is completed by Congress.

The only facilities that are proposed or being considered in wilderness or potential wilderness in this final DCP/EIS are constructed trails; the associated trail heads would all lie outside the NPS wilderness area, as would all proposed visitor centers and other recreation developments. Constructed trails are permissible in wilderness according to the Wilderness Act. Since these are permissible, it is appropriate to consider them in this document.

Floodplains

No proposed actions would be taken in floodplains, except proposed work on the Petersville Road. Upgrade and expansion of the Petersville Road may potentially impact floodplains in the vicinity of stream crossings. These impacts would be analyzed in detail in a subsequent tiered environmental impact statement for this project. No actions in alternative A or B would affect floodplains.

Dall Sheep

The protection of Dall sheep populations and their habitats was one of the purposes for national park boundary expansion in 1980 (ANILCA, sec. 202). However, Dall sheep were not selected as an impact topic, as none of the actions proposed under any of the alternatives would occur in Dall sheep habitat or affect Dall sheep populations.

Flightseeing and Aircraft Landings

Flightseeing and aircraft landings might be affected and are further discussed in this final DCP/EIS to the extent they might be stimulated or constrained by proposed facilities and increased numbers of visitors. Discussion of regulations that apply to flightseeing is not within the scope of this document. Management of this activity would require close coordination with the Federal Aviation Administration, the agency with authority to manage air space. However, it should be noted that both the state and National Park Service have jurisdiction over landings within state and federal parks. The state has recently developed regulations governing such activities in Denali State Park. Landings are prohibited in the national park except under special circumstances.

IMPLEMENTATION OF THE DEVELOPMENT CONCEPT PLAN

This section is included to emphasize the importance of coordinated implementation and to illustrate the commitments being made by the planning partners, individually and collectively. Most implementation tasks would occur under any of the action alternatives, although a few, as noted, are only associated with the proposed action.

Most of the facility proposals in this plan are intended for state park land and general state land outside the national park. Proposals for nonfederal land would be considered in conjunction with applicable state and borough management plans. In the case of discrepancies, the plan proposals should be viewed as indications of what facilities the cooperative planning partners consider appropriate for federal funding assistance or cost-sharing arrangements. When state or borough plans differ or conflict with this development concept plan, the state or borough plans would prevail, unless they are updated to conform with this plan. In all cases, state and borough officials have final authority over their respective land management decisions.

Just as this plan could not be successfully prepared and approved without the work of the Denali Task Force and the intensive cooperative effort between the major public landowners and managers on the south side in consultation with the public, plan implementation would necessitate a continuing cooperative partnership approach, also with public input. This plan proposes the formal establishment of a Denali South Side Plan Implementation Partnership. This group would be established by the governor of Alaska and would likely include the six agencies/organizations that developed this south side plan, plus some other groups determined to be critical to the implementation of the plan.

Implementation would be closely coordinated to meet state, NPS, borough, Native corporation,

and local community needs. The partnership team would serve as a monitoring group, with substantial community involvement, to evaluate the progress of implementation activities and associated mitigation actions and to keep these functions linked. The partnership would be strongly committed to continued citizen/public meetings and other means of public involvement throughout plan implementation.

Implementation of the development concept plan would occur under a logical and cost-effective phasing scheme developed by the Denali South Side Plan Implementation Partnership. The partners are committed to developing a feasible funding strategy, which is key to the implementation of a south side plan. Due to the uncertainties of funding sources and complexities of possible additional road planning, this plan does not include the details of what specific development would be included during various phases. (See the "Alternatives, Including the Proposed Action" chapter for a more detailed discussion of logical sequencing.) Phasing in practical, achievable steps will be critical to successful implementation to ensure that appropriate controls and mitigation are in place when needed. Comprehensive, cooperative planning would continue.

Land use management/controls would also be critical to effective implementation of the plan. Additional or revised land management plans and controls must be in effect *before* major development occurs. The plan should be sensitive to local concerns, ensuring that local input helps guide follow-up decision making to reduce effects on area residents (e.g., emergency services and the local tax base). Corridor management techniques should control strip development before it becomes a problem. For example, substantial development at the Tokositna site would be preceded by planning and development controls in the area. The adequacy of these controls would be determined by the partnership team, in consultation with the

public, prior to proceeding with development implementation.

Members of the implementation partnership are also committed to the tasks listed below to implement the plan. Joint commitments are listed first, followed by a list for each partner. Additional details on these tasks can be found in the next sections of this document.

Joint Commitments

- Assist in overall project development and research.
- Develop additional details on phasing, funding, and plan implementation.
- Continue coordination on related issues that affect multiple landownerships.
- Secure funding for additional studies, facility site planning, design, and construction.
- Pursue creative funding strategies, including private sector options for construction and operation.
- Ensure projects are accomplished in a cost-effective manner.
- Ensure that necessary staffing and operating funds are available to implement the plan.
- Work with local residents and businesses to help address the need for services (fire protection, EMS, ambulance) resulting from plan implementation.
- Coordinate management of existing uses (both motorized and nonmotorized) such as snowmachining, ATV use, boating, skiing, dogsledding, mining, hunting, and aircraft use.
- Assess the progress of plan implementation after three years in light of funding availability, results of wildlife research, and progress on identified mitigation strategies, and adjust priorities or management emphasis as needed.
- Coordinate any significant amendments to the south side plan, if needed.
- Complete additional National Environmental Policy Act compliance prior to construction of major facilities and access upgrades.

- Ensure continued public involvement and review at all levels.
- Review and comment on draft documents prepared for implementation.
- Ensure that additional or revised land management plans and controls are in effect before major development occurs.
- If the proposed action is selected, coordinate transportation planning with the Alaska Department of Transportation and Public Facilities and pursue creative funding strategies with the Federal Highway Administration, particularly for early phases of Petersville Road development.

State of Alaska

- Review and revise the *Denali State Park Master Plan*, with emphasis on this development concept plan.
- In cooperation with the National Park Service, conduct wildlife and habitat research for the south side, as needed, prior to construction of facilities.
- Analyze recreational and other public uses.
- Research land status.
- Manage fish and wildlife resources, including watchable wildlife areas.
- Participate in corridor management planning and seek scenic byway designation for portions of the George Parks Highway.
- Manage state rights-of-way to maintain safety and protect scenic values, including selective brushing along the George Parks Highway.
- Support continued mining activities and work with the mining industry and individual claim holders to address mining issues in the project area.

If the proposed action is selected, the state would also do the following:

- Manage state land along the Petersville Road to protect scenic, wildlife, and other resource values and traditional activities, such as mining.
- Incorporate into the Statewide Transportation Improvement Program a project to improve and extend access on the Petersville Road commensurate with construction phasing.
- Plan and complete environmental work for upgrading and extending the Petersville Road.
- Review and modify as necessary the *Susitna Area Plan* and other policies to designate the immediate road corridor lands for retention in public ownership.
- Consider land exchanges with the borough along the Petersville Road to provide alternate borough lands that are better suited to development.

National Park Service

- In cooperation with the state, conduct wildlife and habitat research for the south side, as needed, prior to construction of facilities.
- Analyze recreational and other public uses.
- Conduct land status research.
- Conduct archaeological research.
- Complete a backcountry management plan.
- Complete detailed site planning for facilities and services and environmental work, as well as National Environmental Policy Act compliance, if federal monies are involved.
- Implement ANILCA, Title XIII, with regard to federal expenditures for visitor centers, facilities, and services.

Denali Borough

- Undertake local community and regional land use planning and regulation, as appropriate.

Matanuska-Susitna Borough

- Undertake local community and regional land use planning and regulation, as appropriate.
- Complete corridor management plans for the Petersville Road and portions of the George Parks Highway.
- Use community-based recommendations for managing growth associated with the proposed development and methods for improving current corridor use.
- Consider state scenic byway designation for portions of the George Parks Highway, including the section in Denali State Park.
- Consider land exchanges with the state to provide alternative borough lands that are better suited for development.
- Use deed restrictions or other measures (e.g., vegetative buffers) to protect corridor values during borough land disposals.
- Manage borough lands along the George Parks Highway and Petersville Road to protect resource values and maintain and enhance the scenic driving experience.

Ahtna, Inc.

- Explore the potential to develop/operate tourism facilities.

Cook Inlet Region, Inc.

- Explore the potential to develop/operate tourism facilities

ALTERNATIVES, INCLUDING THE PROPOSED ACTION

INTRODUCTION

FORMULATION OF THE ALTERNATIVES

This *Final Development Concept Plan and Environmental Impact Statement* presents three action alternatives, including a proposed action, for improving visitor access, interpretation, and recreational opportunities on lands south of Mount McKinley and the Alaska Range and along the George Parks Highway. A no-action alternative is also presented.

All alternatives were developed through a cooperative partnership with the state of Alaska, the National Park Service, the Denali and Matanuska-Susitna Boroughs, Ahtna, Inc., and Cook Inlet Region, Inc. The original concept for the proposed action was based on recommendations of the Denali Task Force, a subcommittee of the National Park System Advisory Board formed in 1994 at the request of Secretary of the Interior Bruce Babbitt. The alternatives are the result of additional public input since the 1993 draft DCP/EIS, including public comments on the 1996 revised draft DCP/EIS, and discussion by the planning partners formed in 1995 to cooperatively develop this DCP/EIS.

An underlying assumption for each alternative is that the planning horizon—the time within which all actions should be implemented—would be long-term, 15 to 20 years. Due primarily to the topography of the south side and locations of existing access roads, most facilities considered in this document would be constructed on lands outside Denali National Park and Preserve on state, borough, and/or private lands. Alternative actions span different jurisdictions, administrative/legislative boundaries, and program areas, and their construction of a visitor center in Talkeetna was considered in the 1993 draft DCP/EIS for the south slope and recommended by the Denali Task Force. However, after further analysis, this alternative has been eliminated from consideration. The recently constructed 5,000-

successful implementation therefore depends on the cooperation and effective coordination of a variety of governmental and nongovernmental entities.

Facilities considered include visitor centers and associated access and parking, campgrounds, public use cabins, and trails. The alternatives differ in their construction costs, extent and location of visitor facilities, and corresponding environmental, social, and economic impacts. The development would occur under a logical and cost-effective phasing scheme developed by a Denali South Side Plan Implementation Partnership in consultation with the public.

The no-action alternative describes existing federal, state, and borough plans for south side visitor services, facilities, and programs that would be implemented even if none of the action alternatives were selected.

Summary comparisons of the alternatives and their potential environmental impacts are included at the end of the “Alternatives, Including the Proposed Action” chapter (see tables 1 and 2). Development cost estimates for the three action alternatives are included in appendix E. Staffing, operation, and maintenance cost estimates are provided for all the alternatives in appendix F.

ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER CONSIDERATION

Talkeetna Visitor Center

square-foot mountaineering contact center in Talkeetna could provide general visitor services while the National Park Service works with Talkeetna residents and businesses to identify other facilities in the community that could be enhanced to provide additional visitor services

if needed. Extensive local public concern exists about the potential adverse impacts on the rural character of Talkeetna of building a new visitor center. This plan does not propose a visitor center in Talkeetna.

Public Use Cabins and Lengthy Backcountry Trails in Denali National Park and Preserve

In the 1993 draft DCP/EIS, lengthy backcountry trails and public use cabins were proposed for the south side, including areas inside Denali National Park and Preserve that have been found suitable for wilderness designation. Constructed trails and public use cabins (for reasons of public health and safety) are permissible in Alaskan wilderness. However, lengthy backcountry trails and public use cabins in the national park and preserve have been dropped from consideration as an alternative due, in part, to adverse public comment on them in the 1993 draft DCP/EIS. (Note that public use cabins are a component of the proposed action presented in this DCP/EIS, but they are located in Denali State Park and on other state lands, rather than in the national park and preserve.) A final wilderness/backcountry management plan has not been completed for Denali National Park and

Preserve, and until it is, no decisions for or against constructing lengthy trails and cabins in wilderness or potential wilderness areas in the national park and preserve on the south side will be made.

Windy Creek Trail Enhancement

Enhancement of this existing trail located in the Cantwell area into Denali National Park and Preserve was considered as a possible component of the proposed action. Present access to this trail is across private lands, and the trail is used by local residents, primarily as an important subsistence use area for caribou and moose. This alternative was eliminated from further consideration in this document due to concerns about potential conflict between subsistence and nonsubsistence users, strong support from the subsistence resource commission to refrain from promoting additional public use of this trail, and probable difficulty in securing public access across private lands to access the trail.

ELEMENTS COMMON TO ALL ACTION ALTERNATIVES

Certain general policies and actions would be implemented under each action alternative.²

GENERAL POLICIES

Lodging, restaurants, and other primarily commercial facilities and services should only be developed on private lands. Small-scale ancillary food service may be appropriate in some cases on public lands and in public facilities. Construction of full-service campgrounds (with hookups) on private lands would be encouraged.

Except in specific development areas highlighted in this plan, the wild character of Denali State Park and Denali National Park and Preserve should be protected.

New facilities and uses should be designed and located to minimize impacts on existing uses (e.g., mining, subsistence, wildland recreation).

Pursuant to ANILCA, sections 1306 and 1307 and established 1306 implementation policy, the National Park Service would continue to be committed to giving priority to the application of Title XIII with regard to federal expenditures for visitor facilities and services (see appendix G for implementation guidelines).

Development should be phased in practical and achievable steps.

ACTIONS

2. Some of these actions would also be implemented under the no-action alternative (alternative C); these are indicated by an asterisk (*) and are listed again under alternative C.

Up to two additional roadside exhibits would be developed at existing pullouts along the George Parks Highway.

Watchable Wildlife areas along the George Parks Highway and/or the Petersville Road would be identified and established based on existing and additional scientific information (e.g., wildlife, habitat). Such sites could include Horseshoe Creek and Troublesome Creek.

Self-guiding interpretive brochures would be developed for appropriate portions of the George Parks Highway and the Susitna River.

The state would continue to manage state rights-of-way to maintain safety and protect scenic values. Management tools include vegetation management, driveway and pullout location and design, frontage roads, enforcement of sign laws, and addressing encroachments. Selective brushing and vista clearing would be conducted to improve views along the George Parks Highway.

As appropriate, Matanuska-Susitna Borough's Special Land Use District currently in place in Denali State Park would be reviewed and revised to improve implementation and enforcement.*

The Matanuska-Susitna Borough expects to complete separate corridor management plans for the Petersville Road and portions of the George Parks Highway to develop community-based recommendations for managing continued growth in the region. Under these plans, the borough would manage its land along these corridors to protect resource values associated with the proposed development and to maintain and enhance the scenic driving experience. Borough land disposals along these routes could include deed restrictions, vegetative buffers, or other measures to protect corridor values. (See discussion on land use in the "Affected Environment" chapter, "Socioeconomic

Environment” section, for more details on corridor management plans.)*

The state, the National Park Service, the boroughs, and other jurisdictions, as appropriate, would work together to manage recreational activities and other uses of public lands in the area. These uses would continue but would be managed to protect the area and preserve a quality experience. Existing travel modes, both motorized and nonmotorized (aircraft, snowmachines, boats, ATVs, skis, dogsleds, etc.) would be examined to determine the need for, and appropriateness of, new access points, parking, restrooms, trails, corridors, signing, mapping, and other special measures.* (Note that in the no-action alternative such efforts would continue, but would be less comprehensive and lower priority.)

State land management plans and policies would support the maintenance of mining activities. The state would work with the mining industry and individual claim holders to address mining issues in the project area, such as RS 2477 rights-of-way, recreational mining proposals, status and shared use of roads, and avoidance/ mitigation of conflicts between mining and other land uses.*

State scenic byway designation for portions of the George Parks Highway, including the section in Denali State Park, would be considered following corridor management planning by local governments.*

Studies on the natural and cultural resources and human uses of the planning area would be conducted in advance of south side development as appropriate. The National Park Service, the state, and others would work cooperatively to carry out this research. Studies would have the objectives of providing broad spectrum resource data useful in environmental analyses and in addressing human use issues; providing site-specific resource information for facility design and siting; and filling voids in existing baseline information, particularly as it relates to sensitive species or ecosystem elements.* (Note: In the no-action alternative, general information gathering would continue, but not at the pace, depth, or level of funding that would be anticipated if the site-specific developments described for the action alternatives were to be undertaken.)

A Denali South Side Plan Implementation Partnership would be formally established to continue the cooperative partnership approach in implementing the development concept plan. This partnership team would also serve as a monitoring group to evaluate the progress of implementation activities and associated mitigation actions and to keep these two items linked. Substantial community involvement would be a part of this plan implementation.

PROPOSED ACTION (REGIONAL STRATEGY)

GENERAL CONCEPT

The emphasis of the proposed action is on providing visitor facilities and services throughout the south side to meet a wide range of needs and interests of the region's diverse user groups. Visitor facilities would be developed in the Tokositna area near the end of the Petersville Road and along the George Parks Highway in Denali State Park, at Chelatna Lake, and in the Dunkle Hills area.

In the Tokositna area visitors could obtain area-specific park orientation and interpretive information at a visitor center, explore the area and access Denali National Park and Preserve via hiking/interpretive trails, or make use of a campsite or public use cabin (see the Proposed Plan map). This component of the plan would provide the visitor with a sense of departing the main highway and its faster pace and arriving at a wilder, slower-paced locale. Facilities and road improvements would be designed with this purpose in mind. Development at Tokositna would provide access to the superb views in the area and provide opportunities for the visitor to immerse oneself in the landscape and be surrounded by the Alaska Range. Facilities would be designed to encourage visitors to leave their vehicles and experience the adjacent tundra/alpine landscape in both the state and national park. Tokositna would also serve as a jumping-off point for longer hiking or backcountry trips in the surrounding wild lands.

Other areas would also be developed to allow visitors to more fully experience the south side. An interpretive center, a campground, interpretive roadside exhibits, and trails would be available and accessible in Denali State Park via the George Parks Highway. These facilities would be provided for visitors seeking convenient information and orientation to the area, for those wishing to use that area of the Critical to the implementation of this alternative would be the development of a phasing scenario based on practical and achievable steps. This

state park for recreation, and for those users who do not have the time, interest, or resources for an off-the-main-highway experience such as at Tokositna.

Additionally, a hiking trail, a few campsites, and some public use cabins would be available primarily for fly-in visitors at Chelatna Lake. A trailhead would also be developed in the Dunkle Hills.

Viewed as a whole, these south side facilities and services should benefit all visitors, including Alaska residents, independent travelers, and package tour travelers.

What follows are conceptual descriptions of the proposed visitor facilities. More detailed information and analysis of the exact site location, design, capacity, and function of each component would be covered in associated partnership plans, such as the revision of the *Denali State Park Master Plan* that is underway by the state of Alaska, or in other subsequent, site-specific planning, environmental analyses, and public involvement.

The state would manage state-owned lands along the Petersville Road to protect scenic, wildlife, mineral, recreation, and other resource values.

Land management plans and controls would have to be in effect and resource studies completed before significant development could occur under any of the action alternatives. The implementation partnership team, in consultation with the public, would determine when such controls and studies were sufficient to begin development.

PHASING

phasing would allow proposed development to be implemented over time, a 15- to 20-year period, as funding becomes available for

construction. Some developments could occur in 3 to 5 years; others would occur in 5 to 15 years or more. Partnerships would be explored among the state of Alaska, tourism groups, Cook Inlet Region, Inc., the Matanuska-Susitna Borough, the National Park Service, and others determined critical to plan implementation.

Determining appropriate phasing is not only important for scheduling development activities, but also is necessary to allow time for completion of needed additional plans and environmental evaluations, implementation of needed land use actions, developing additional knowledge about the resources that may be affected, and securing adequate staffing to operate the facilities.

Due to the uncertainties of funding sources and complexities of the additional road planning, this DCP/EIS does not include details of what development would be included in different phases; however, the following indicates a logical sequence of development.

Step one could include:

Conduct resource studies and additional public involvement.

Implement land management controls and mitigation actions.

Develop detailed plans for the Petersville Road upgrade, guided by the South Side DCP. Complete Petersville Road improvement environmental impact statement that would detail road design standards and a phasing scenario.

Develop plans for interpretive and recreation developments at the Tokositna site and on the George Parks Highway, coordinated with the phasing scenario developed for the road improvements. One or more project-specific environmental assessments would be prepared for this facility development.

Develop access strategy for Dunkle Hills area.

Step two could include:

Develop access to the Tokositna site.

Develop facilities and trails at Tokositna.

Develop George Parks Highway facilities.

Develop Chelatna Lake facilities.

Develop Dunkle Hills access.

Additional details on phasing would be developed in follow-up plans and in subsequent site-specific analyses. Determining phases and ensuring necessary follow-up work would be a key responsibility of the implementation partnership team discussed above.

VISITOR CENTERS

The plan proposes two visitor centers, one in the Tokositna area and one near Byers Lake. These visitor centers could be built as a joint effort between the state, federal government, boroughs, or Native corporations, or as a public-private partnership. In either case, construction of the facilities would be contingent on an agreement between the National Park Service and the Alaska Division of Parks and Outdoor Recreation regarding cost sharing, operation and maintenance, exact location, and site and facility design as well as appropriation of sufficient funding. The public would have opportunities to review and comment on the specific location of the centers (and associated facilities such as trails and picnic areas), and site-specific and architectural designs, during future environmental analyses.

Tokositna Visitor Center and Associated Petersville Road Improvements

A visitor center (up to 5,000 square feet) would be constructed near the Tokositna overlook, an alpine saddle above the Tokositna River and Glacier in the Ramsdyke Creek and Long Point area of Denali State Park (see the Proposed Plan map). The Tokositna visitor center would serve the needs of both Denali State Park and Denali National Park and Preserve, and would be expected to receive approximately 207,000 visitors per year by the year 2012. As stated above, this center would be constructed in phases based on funding availability and coordinated with the phasing scenario developed for the Petersville Road improvements/upgrade (see details below on the road).

The visitor center would include space to provide information and orientation to the Tokositna area, an indoor exhibit room, an indoor and outdoor viewing area, a simple food service area that would not require kitchen facilities, a small interpretation-oriented sales shop, and public restrooms. Administrative space for a combined state and NPS staff would also be included, along with maintenance and storage space. Covered and uncovered, open-air picnic facilities with a capacity for about 50 people would be provided in the vicinity of the visitor center. A helicopter pad for use in emergency situations would also be sited nearby. Parking would be provided for up to 45 cars and 30 buses or recreational vehicles (RVs).

The center would be intended primarily for summer use, but would be designed and built for year-round capability. Winter maintenance of the Petersville Road would not extend beyond the Forks Roadhouse at about mile 19, and winter access would be by snowmachine or skis. Winterized accommodations for a caretaker and up to three park rangers (for a staffing coverage of two rangers per day, seven days per week) would be provided to allow for limited visitor services in the winter and to give rangers a base for year-round patrols. Decisions on the exact location of the employee housing (e.g., whether part of the visitor center or separate from it) would be made during the

design phase. Additional housing for seasonal employees would be a combination of cabins or bunkhouses in the vicinity of the Tokositna facilities and housing provided in nearby local communities from which employees would commute. For purposes of this document, it is assumed that up to five 200-square-foot cabins, accommodating two people each, would be constructed for seasonal employees. The cabins themselves would have no water, but a 500-square-foot showerhouse and central cooking and eating facility would be constructed nearby.

All utilities associated with the Tokositna visitor center, except those related to solid waste disposal, could be provided onsite. Electricity would be provided by a generator, and fuel storage would also be onsite. A septic system would be needed. Solid waste would be transported to another location for disposal. State-of-the-art technology and practices for remote sites would be implemented, emphasizing sustainable design and use.

The proposed action includes a major upgrade and extension of the Petersville Road. Improvements to the road would involve building up and widening the road base from mile 19 at the Forks Roadhouse to the Tokositna site at about mile 40. Extensive reconstruction would be done along the road from Petersville through Peters Creek Canyon. Six to seven miles of new construction from the west end of the canyon to the visitor center site would be required to complete access. This plan does not propose additional work on the portion of the road from the George Parks Highway to mile 19, as it is assumed that the road standards and conditions along this section are generally adequate for the purposes of this South Side DCP. Furthermore, maintenance of this section and additional improvements would likely be carried out by the state regardless of this development concept plan.

As stated above, improvement and upgrade of the Petersville Road would likely take place over a number of years, depending on funding, mitigation, and other factors. Ultimately, the entire length of the road would likely be paved

ALTERNATIVES, INCLUDING THE PROPOSED ACTION

and designed to accommodate a variety of vehicle types, including automobiles, RVs, and buses. Appropriately sited bicycle and pedestrian enhancements would also be provided as part of, or separate from, the road and would be in Proposed Plan map

keeping with the vision, goals, and objectives of the south side plan and with the state's Trails and Recreational Access for Alaska (TRAAK) program. It would also be designed for safe travel and be cost-effective to maintain.

Interpretive signs and pullouts would be placed along the road; specific locations and designs for these structures would be identified during future planning efforts. Winter maintenance of the road would not extend to the Tokositna site, but only from the George Parks Highway junction to the Forks Roadhouse at about mile 19. For analysis purposes, the following three options for Petersville Road development were prepared:

Option one – a road with two 10-foot driving lanes with 2-foot-wide paved shoulders and a separated 10-foot-wide paved bicycle/ pedestrian pathway.

Option two – a road with two 12-foot-wide driving lanes with 2-foot paved shoulders and a separated 10-foot-wide paved bicycle/ pedestrian pathway.

Option three – a road with two 12-foot-wide driving lanes with 6-foot paved shoulders to accommodate bicycles/pedestrians (i.e., no separated pathway).

Even under options one and two, about 3 miles of the bicycle/pedestrian pathway would have to be constructed on the shoulder of the road when passing through the Peters Creek Canyon and other areas due to terrain conditions. Based on the visitor experience outlined above, final design standards, as well as possible controls on access, would be developed by the state in a follow-up design process with tiered environmental documentation.

The full appreciation of a visit to a state or national park depends on a safe and enjoyable travel experience. The character of the Petersville Road would play a role in the Tokositna experience. Consequently, the rehabilitation/reconstruction of the Petersville In cooperation and, where desirable, a partnership among the National Park Service,

Road would be designed to enhance the traveler's experience en route to the Tokositna Visitor Center by taking advantage of the area's natural beauty as an additional benefit to the "park" experience.

The Petersville Road beyond the Forks Roadhouse would be designed with horizontal and vertical curves that fit the landscape rather than long tangents that encourage high speed travel. The location and design of a road that includes an enjoyable pedestrian facility would require a blending of experiences for both the vehicular traveler and the pedestrian or biker.

The road would service roadside recreational opportunities and local access as well as the scenic attractions. Finally, the upgrade of the road must include practical environmental protection measures and accepted best management practices.

The state would address issues related to development and anticipated increased public use of state land along the Petersville Road through additional land planning and management. The state would reevaluate the provisions of the *Susitna Area Plan* for state land along the Petersville Road, with the intent of protecting scenic, wildlife, mineral, recreation, and other resource values. The state would develop proposed amendments to the *Susitna Area Plan* to define what uses would be allowed on state land along the road. The *Susitna Area Plan* already prohibits sales of state land along the Petersville Road north of the Forks Roadhouse. Subsequent planning would evaluate additional areas between the George Parks Highway and the Forks Roadhouse that should also be retained in state ownership. Land exchanges with the state could be considered to provide alternative borough lands that are better suited for development.

Other Visitor Facilities and Related Services

local communities, ANCSA Native corporations, and the state of Alaska would

develop visitor facilities and services at Talkeetna, Broad Pass, and in the central development zone of Denali State Park when the need and opportunity to do so are established. Consultation and coordination with local communities to define need and determine appropriate courses of action would be essential. For the state park central development zone this would entail constructing a visitor center up to 3,000 square feet in size. See the Existing Conditions Detail - Denali State Park map.

The soon-to-be completed 320-square-foot visitor contact facility adjacent to the Alaska Veterans Memorial at Byers Lake would provide general visitor information until a new 3,000-square-foot visitor center could be built in this general area. The 3,000-square-foot visitor center would be constructed within the central development zone of Denali State Park within easy access of the George Parks Highway. It would be a joint state and national park facility and would be intended initially for summer use, but would be designed for year-round operations capability. The center would include space for distributing trip planning/orientation information and Denali National Park and Preserve shuttle bus reservations, a small area for interpretive displays, and public restrooms. Administrative space for a combined state and NPS staff of two to three people also would be included, as would storage areas. Parking would be provided for up to 25 cars and 15 buses or RVs. An access road of up to 2,000 linear feet would also be constructed, depending on the location of the visitor center.

All utilities associated with this smaller visitor center, except those related to solid waste disposal, would be provided onsite. Onsite fuel storage also would be provided. Solid waste would be transported to another location for disposal.

An exact location for this visitor center would be selected through subsequent planning. Siting would consider views of Mount McKinley, hiking opportunities, wildlife and other impacts, and highway safety considerations.

In cooperation, and where desirable, partnerships for providing additional visitor services along the George Parks Highway may be pursued.

CAMPGROUNDS

Under the proposed action, only standard public campgrounds would be developed, as these are currently underprovided by the private sector. For purposes of this plan, standard campgrounds are defined as those having basic facilities such as water, picnic tables, grills, and vault toilets. They may even be more primitive than this in certain areas. They do not provide full RV-type services such as electrical hookups, RV dump stations, or shower-type restroom facilities. Construction of full-service campgrounds is encouraged on private lands in the south side planning area.

Public camping facilities would be developed or expanded in the Tokositna area, central development zone of Denali State Park, and Chelatna Lake.

Tokositna Area

Up to 50 sites would be built in the vicinity of the proposed Tokositna visitor center for tents or primitive RV camping. Additional detail on exactly where campsites would be developed would be determined through subsequent planning and appropriate National Environmental Policy Act compliance for the developed area. Separated tent camping or walk-in sites could be considered. Camping facilities could be operated by the state, National Park Service, private concessions, or some combination thereof.

Central Development Zone

Camping opportunities in Denali State Park would be increased either by expanding the existing facility by up to 25 new sites at Byers Lake or developing a new campground of up to 50 sites elsewhere in the central development zone of the state park. Details on this campground expansion would be developed in a state park master plan amendment.

Chelatna Lake

Up to five primitive fly-in only tent camping sites would be developed at Chelatna Lake. Siting for these facilities would be done by state of Alaska personnel, in consideration of several factors — protection of wildlife, wetlands, and water quality; private lands in the area; and proximity to trail access.

TRAILS

Under the proposed action, interpretive trails and/or hiking trails, where possible leading through the brush to alpine terrain in the state and national parks, would be developed in the Tokositna area, Chelatna Lake, the central development zone of Denali State Park, and the Broad Pass/Dunkle Hills areas. The trails would generally be less than 5 miles in length (one-way) and would be developed for a diverse public with varied abilities and interests. Detailed trail locations would be developed through subsequent trail planning by NPS and state of Alaska personnel. Appropriate measures would be taken to minimize or eliminate impacts on vegetation and wildlife (see the “Mitigating Measures Common to All Action Alternatives” section).

Tokositna Area

A system of short hiking/interpretive trails in the visitor center area and longer trails through the brush to alpine terrain in Denali State Park and Denali National Park and Preserve would be developed. Due to the important calving habitat it provides for the Denali Caribou Herd, management of the

developed in the Tokositna area, including a possible trail to Long Point.

Chelatna Lake

A hiking trail would be constructed through the brush from Chelatna Lake leading to alpine terrain in Denali National Park and Preserve. A sign covering basic trail and safety information would be placed at the trailhead.

Central Development Zone

A hiking/interpretive trail would be developed in conjunction with the visitor center in the central development zone of the state park if the center is not located adjacent to the existing Byers Lake loop trail. Additional short hiking trails may be developed in this area.

Broad Pass/Dunkle Hills

The state right-of-way into the Dunkle Hills and Golden Zone areas could provide increased public access opportunities for hiking, bicycling, and mining-related interpretive opportunities once land status issues are resolved. Access to mining-related interpretation and private inholdings would be the primary function of the main portion of the right-of-way, which leads south across the West Fork of the Chulitna River to the Golden Zone area (see the Existing Conditions Detail - Dunkle Hills Area map). The other portion of the right-of-way, which diverges from the Golden Zone route and leads northeast into the Dunkle Hills, would be primarily for hiking and bicycling, subject to valid existing rights. For the purposes of analysis, this DCP/EIS assumes construction of a trailhead along the right-of-way at or near the national park boundary to provide improved access to Denali National Park and Preserve and a gravel parking area for 10 vehicles at or near the trailhead.

Dunkle Hills area around the northern right-of-way section would emphasize low density,

primarily nonmotorized human activities. This area would provide increased backcountry and day hiking opportunities for visitors to Denali National Park and Preserve. Additional management guidance for this area would be developed in upcoming revisions of the *Backcountry Management Plan* for the national park. Management intent for the right-of-way would be developed in consultation with affected inholders and with the concurrence of the state, which retains jurisdiction over use of the right-of-way. Future specific proposals (e.g., those that would increase public access into the Dunkle Hills area) would require additional, site-specific environmental evaluation and public review.

PUBLIC USE CABINS

Public use cabins would be developed in the Tokositna area and at Chelatna Lake. The cabins would be designed and built for year-round use. Each cabin would be up to 400 square feet and would provide sleeping space for four to six people. No water would be provided in these cabins. Cabins would be sited by state personnel,

with possible assistance from the National Park Service, based on private land issues in the area and protection of wetlands, water quality, and wildlife.

Tokositna Area

Up to four public use cabins would be built on state land in the vicinity of the Tokositna visitor center, near the site of the public campground.

Chelatna Lake

Up to two fly-in only public use cabins would be built on state land at Chelatna Lake. At least one would likely be located near the proposed trailhead.

ALTERNATIVE A (LARGE-SCALE VISITOR FACILITY ALONG THE GEORGE PARKS HIGHWAY)

GENERAL CONCEPT

The emphasis of this alternative is on providing visitor facilities and services within easy access from the George Parks Highway. The array of facilities would be less extensive than under the proposed action (see the Alternative A map). Under alternative A, no facilities would be provided in the Tokositna area of the state park, and there would be no upgrade or extension of the Petersville Road beyond mile 19; neither would facilities be developed at Chelatna Lake or in the Dunkle Hills/Mine area.

The primary focus for facilities and activities under alternative A would be along the George Parks Highway in Denali State Park where a large visitor center would be constructed in one of the three state park development zones. (Development zones are described in the *Denali State Park Master Plan* and are shown on the Existing Conditions Detail - Denali State Park map.) A large campground, hiking/interpretive trails, and roadside exhibits also would be developed.

What follows are conceptual descriptions of the visitor facilities that would be built under alternative A. More detailed information and analysis of the exact site location, design, capacity, and function of each component would be covered in associated partnership plans, or in other subsequent, site-specific planning and environmental analyses, which would be made available for public review and comment.

VISITOR CENTER

Under alternative A, a large (up to 13,000 square feet) visitor center would be constructed along the George Parks Highway either in the northern development zone (along the last 3 miles of the highway as it exits the northern end of the state park), in the central development

zone (approximately 1 mile either side of the Byers Lake campground), or in the southern development zone (along the highway within the first 4 miles north of the Chulitna River bridge). The visitor center would serve the needs of both Denali State Park and Denali National Park and Preserve, and would be expected to receive about 254,000 visitors per year by the year 2012.

The center would be intended primarily for summer use; however, portions of it would remain open year-round to serve winter visitors. The center would include space for distributing trip planning/orientation information and national park and preserve shuttle bus reservations, an auditorium for interpretive programs with about 100 seats, a large indoor exhibit room, an indoor and outdoor viewing area, a simple food service area that would not require kitchen facilities, a small interpretation-oriented gift shop, and public restrooms. Administrative space for a combined state and NPS staff of about eight would also be included, as would maintenance and storage space. A covered outdoor picnic shelter with a capacity for about 25 people would be provided nearby. Parking would be provided for up to 60 cars and 40 buses or RVs. An access road of up to 2,000 linear feet, depending on the development node selected for the visitor center, would also be constructed.

All utilities associated with the visitor center, except those related to solid waste disposal, would be provided onsite. Fuel storage also would be provided onsite. Solid waste would be transported offsite for disposal. Some onsite employee housing may also be provided, including two small winterized apartments incorporated in the visitor center facility.

The visitor center would be physically oriented and designed to provide views of the Ruth or Eldridge Glacier, the Chulitna River, and/or the summit of Mount McKinley, and it would

provide interpretation of these views. In addition to the

Alternative A map

views, interpretation would focus on the human history and natural resources of the south side, including its wildlife and vegetation and its challenging mountaineering routes.

The visitor center could be constructed on state land or on private land acquired for this purpose by the state or federal government. If the southern development zone were selected as the visitor center location, the state may need to acquire, on a willing-seller/willing-buyer basis, or lease private lands within the visitor center viewshed in order to protect the viewshed's visual integrity.

The visitor center would be built as a joint effort between the state, federal government, boroughs, and/or Native corporations, or as a public-private partnership. In either case, construction of the facility would be contingent on agreements regarding cost sharing, operation and maintenance, exact location, and site and facility design as well as appropriation of sufficient funding. The public would have opportunities to review and comment on the specific location of the center (and associated facilities such as trails and picnic areas), and site-specific and architectural designs during future site-specific and more detailed planning and environmental analysis.

CAMPGROUNDS

As under the proposed action, camping opportunities in Denali State Park would be increased either by expanding the existing Byers Lake facility by up to 25 sites or developing a new campground of up to 50 sites in the central development zone of the state park. The latter would be undertaken if necessary to avoid increasing bear-human encounters at Byers Lake. Details on this campground expansion would be developed in a state park master plan amendment.

TRAILS

Short hiking/interpretive trails would be built on lands surrounding the visitor center in Denali State Park. The trails would generally be less than 5 miles in length and would be developed for a diverse public with varied abilities and interests. Detailed trail locations would be developed through subsequent trail planning by NPS and state of Alaska personnel. Appropriate measures would be taken to minimize or eliminate impacts on vegetation and wildlife (see the "Mitigating Measures Common to All Action Alternatives" section).

PUBLIC USE CABINS

No public use cabins would be developed under this alternative.

ALTERNATIVE B (SMALL-SCALE VISITOR FACILITY ALONG THE GEORGE PARKS HIGHWAY)

GENERAL CONCEPT

Like alternative A, the emphasis of alternative B is on providing visitor facilities and services within easy access from the George Parks Highway. No facilities would be provided in the Tokositna area of the state park nor would the Petersville Road be upgraded or extended beyond mile 19; neither would facilities be developed at Chelatna Lake or in the Dunkle Hills area. In addition, the level of development along the George Parks Highway under alternative B would be less extensive than in either the proposed action or alternative A (see the Alternative B map).

The primary focus for facilities and activities under alternative B would be along the George Parks Highway in Denali State Park where a small visitor center would be constructed in one of the three development zones of the state park. (Development zones are described in the *Denali State Park Master Plan* and are shown on the Existing Conditions Detail - Denali State Park map.) A small campground, hiking/ interpretive trails, and roadside exhibits would also be developed.

What follows are conceptual descriptions of the visitor facilities that would be built under alternative B. More detailed information and analysis of the exact site location, design, capacity, and function of each component would be covered in associated partnership plans, or in other subsequent, site-specific planning and environmental analyses, which would be made available for public review and comment.

VISITOR CENTER

A small visitor center (about 1,500 square feet) would be constructed along the George Parks Highway in either the northern, central, or

southern development zone of Denali State Park. The visitor center would serve the needs of both Denali State Park and Denali National Park and Preserve.

The center would be intended primarily for summer use; however, it could remain open year-round to serve winter visitors. The center would include space for distributing trip planning/orientation information and Denali National Park and Preserve shuttle bus reservations, and public restrooms. Administrative, maintenance, and storage space would not be provided. Parking would be provided for up to 20 cars and 10 buses or RVs. An up to 2,000-linear-foot access road would also be developed depending on the site selected.

All utilities associated with this small center, except those related to solid waste disposal, would be provided onsite. Fuel storage would also be provided onsite.

The visitor center could be constructed on state land or on private land acquired for this purpose by the state or federal government. If the southern development zone were selected as the visitor center location, the state may need to acquire, on a willing-seller/willing-buyer basis, or lease private lands within the visitor center viewshed in order to protect the viewshed's visual integrity.

The visitor center could be built as a joint effort between the state, federal government, boroughs, and/or Native corporations, or as a public-private partnership. In either case, construction of the facility would be contingent on agreements regarding cost sharing, operation and maintenance, exact location, and site and facility design as well as appropriation of sufficient funding. The public would have opportunities to review and comment on the specific location of the center (and associated

ALTERNATIVES, INCLUDING THE PROPOSED ACTION

facilities such as trails and picnic areas), and site-specific and architectural designs during a Alternative B map

future environmental analysis.

CAMPGROUNDS

A small campground up to 25 sites would be developed in the central development zone of Denali State Park.

TRAILS

As under alternative A, short hiking/interpretive trails would be built on lands surrounding the visitor center in Denali State Park. The trails would generally be less than 5 miles in length and would be developed for a diverse public with

varied abilities and interests. Detailed trail locations would be developed through subsequent trail planning by NPS and state of Alaska personnel. Appropriate measures would be taken to minimize or eliminate impacts on vegetation and wildlife (see the "Mitigating Measures Common to All Action Alternatives" section).

PUBLIC USE CABINS

No public use cabins would be constructed under this alternative.

ALTERNATIVE C (NO ACTION)

Under alternative C, all facilities would be located in Denali State Park along the George Parks Highway. No facilities would be constructed in the Tokositna area, in the Dunkle Hills, or near Chelatna Lake. The Petersville Road would not be upgraded or extended beyond mile 19 under this alternative. This no-action alternative is primarily intended to provide a clear contrast to the proposal and other action alternatives. The actions listed below are those visitor service related actions that would still be carried out by public land managers on the south side if an action alternative (proposed action, alternative A, or alternative B) was not approved. A full discussion of other regional actions (including those visitor service related actions taken by the private sector) that have been or would be implemented regardless of whether or not an action alternative is approved is provided in the cumulative impacts discussion (see the “Impacts of the Proposed Action” section).

GENERAL ACTIONS

Certain existing management actions and visitor uses on the south side would continue, (e.g., ranger patrols, enforcement of regulations, Talkeetna-based mountaineering expeditions, and flightseeing).

As appropriate, Matanuska-Susitna Borough’s Special Land Use District currently in place in Denali State Park would be reviewed and revised to improve implementation and enforcement.

The Matanuska-Susitna Borough expects to complete separate corridor management plans for the Petersville Road and the George Parks Highway to develop community-based recommendations for managing continued growth in the region. Under these plans, the borough would manage its land along these corridors to protect resource values and to maintain and enhance the scenic driving

experience. Borough land disposals along these routes could include deed restrictions, vegetative buffers, or other measures to protect corridor values.

The state, the National Park Service, the boroughs, and other jurisdictions, as appropriate, would work together to manage recreational activities and other uses of public lands in the area. The state would manage state-owned lands along the Petersville Road to protect scenic, wildlife, mineral, recreation, and other resource values. Existing travel modes, both motorized and nonmotorized (aircraft, snowmachines, boats, ATVs, skis, dogsleds, etc.) would be examined to determine the need for, and appropriateness of, new access points, parking, restrooms, trails, designated corridors, signing, mapping, and other special measures. While these efforts would continue under this alternative, they would not be as high priority or as comprehensive as under the action alternatives.

State land management plans and policies would support the maintenance of mining activities. The state would work with the mining industry and individual claim holders to address mining issues in the project area, such as RS 2477 rights-of-way, recreational mining proposals, status and shared use of roads, and avoidance/ mitigation of conflicts between mining and other land uses.

State scenic byway designation for portions of the George Parks Highway, including the section in Denali State Park, would be considered following corridor management planning by local governments.

The state would continue to manage state-owned lands along the Petersville Road according to the *Susitna Area Plan*. Under the *Susitna Area Plan*, there are no land disposal areas north of the Forks Roadhouse adjacent to the road corridor.

Studies would continue to be needed to address south side issues. The National Park Service, the state, and others would work cooperatively to carry out this research. General information gathering for the south side would continue, but not at the pace, depth, or level of funding that would be anticipated if the site-specific developments described in the action alternatives were implemented, especially those along the Petersville Road.

VISITOR CENTER

A 320-square-foot visitor contact facility would be built adjacent to the Alaska Veterans Memorial at Byers Lake and could provide some visitor information and interpretation services, but these services would be minimal and passive. This facility may not be staffed.

No other visitor centers would be constructed on the south side, nor would the Petersville Road be upgraded and extended under the no-action alternative.

CAMPGROUNDS

No new campgrounds or campsites would be provided on the south side.

TRAILS

No new hiking trails would be constructed on the south side in the near future. However, over the long term, some trail access to the Chulitna River could be provided near the George Parks Highway bridge in the southern development zone of Denali State Park in order to implement the state park master plan. For the purpose of this analysis, it is assumed this trail would be about 100 yards in length and would have a 10-car parking lot associated with it. Construction of this trail access would be based on available funding; at this time, no funding sources have been

identified. No hiking trails would be developed in the Tokositna area, at Chelatna Lake, or elsewhere on the south side.

PUBLIC USE CABINS

The Alaska Division of Land, with financial assistance from the National Park Service, would continue its project to convert an existing privately built cabin near Chelatna Lake to public use. However, unlike under the proposed action, a second cabin in this area would not be constructed, nor would there be any public use cabins built in the Tokositna area. For the purposes of this DCP/EIS, it is assumed that the state would construct four additional cabins on the east side of the Chulitna River in Denali State Park. The cabins would be up to 400 square feet each, and would provide sleeping space for four to six people. No water would be provided in these cabins. Cabins would be sited by state personnel, based on private land issues in the area and protection of wetlands, water quality, and wildlife.

OTHER RECREATION DEVELOPMENTS

Matanuska-Susitna Borough land near the Forks Roadhouse on the Petersville Road has been identified as a potential site for a parking lot for snowmachine users in the Petersville corridor management plan now being developed by the borough. The parking lot would be large enough to accommodate existing snowmachine users in the area. For purposes of analysis, it is assumed that this parking facility would provide space for 100 vehicles towing trailers capable of carrying two snowmachines each. Sanitation facilities would be provided as part of the proposed improvement.

MITIGATING MEASURES COMMON TO ALL ACTION ALTERNATIVES

This section describes measures that would be used to minimize the adverse effects of facility construction and later activities associated with use of the facilities. These measures would apply only in the case of actions taken as part of this South Side DCP; other actions taken outside of this plan or as part of other unrelated plans do not require implementation of these mitigating measures. In a few instances that are indicated, mitigation would apply only to a specific alternative and not to all of the action alternatives. In other cases, also indicated, mitigation would apply only for federal actions or for state or borough actions. No proposals would be implemented unless, and until, necessary mitigating measures could be taken. Unless otherwise noted, mitigating measures would apply under all development alternatives, regardless of whether the proposed actions take place on state, federal, borough, or Native corporation lands.

All construction would be restricted to the minimum area required. During all phases of construction a project supervisor would review the work to ensure that work methods minimize impacts on lands near the construction site and that mitigating measures written into the contract were followed.

REQUIRED RESEARCH

Studies on the natural and cultural resources and human uses of the planning area would be conducted in advance of south side development. Studies would have the objectives of providing broad spectrum resource data useful in environmental analyses and in addressing human use issues; providing site-specific resource information for facility design and siting; and filling voids in existing information, particularly as it relates to sensitive In trumpeter swan nesting areas, all land use activities that would disturb nesting swans or detrimentally alter the nesting habitat would be avoided to the extent feasible and prudent.

species or ecosystem elements. Specific tasks would probably include the following:

- aerial photography and resource mapping
- moose survey(s)
- grizzly and black bear studies
- wolf monitoring
- swan and other waterfowl surveys
- raptor nest documentation
- weather station operation
- fish population surveys
- existing human use and impact analyses
- backcountry management analysis
- vegetation inventory
- archeological, ethnographic, and historic resource surveys

Site-specific tasks would include soils mapping and boring, wetland delineation, and wildlife and vegetation surveys.

WILDLIFE

To minimize wildlife impacts, facilities would be sited to avoid the following sensitive wildlife habitats or activities:

- wildlife travel areas or corridors
- feeding and resting areas
- bear denning sites
- moose winter range
- moose calving areas
- caribou calving grounds
- Dall sheep winter and spring lambing range
- wolf activity or denning sites
- trumpeter swan and Tule greater white-fronted goose nesting, brood-rearing, or molting areas
- raptor nest sites

When avoidance is not feasible and prudent, land use activities would be conducted to minimize disturbance to nesting swans or minimize detrimental alteration of habitat.

Activities that would damage swan nesting habitat or cause visual or noise disturbance should be restricted or prohibited from April 1 through August 31 within at least .25 mile of swan nesting or staging ponds, marshes, or lakes that are actively being used by swans or for which there is a documented history of use. Particular activities may be restricted or prohibited in a wider area if their potential level of damage or disturbance warrants doing so.

Measures would be taken to reduce the potential for bear/human encounters. Visitors would be educated on the proper behavior when recreating in bear country. Availability and use of bear-proof garbage containers would be required around visitor centers, picnic areas, trails, interpretive waysides, and camping facilities. Backcountry users would be required to carry bear-resistant food containers on NPS lands and may be required to do so on state park lands. Trails or trail sections may be closed temporarily or during certain seasons to protect wildlife.

To further reduce the chance of bear/human encounters, trail segments in high-density bear habitat would be kept as straight as possible, maximizing sight distances, and brushy vegetation would be cleared from trail edges and in areas around other visitor facilities. Where linear trail sections are not appropriate (e.g., due to an area being too wet to allow for a straight route), less densely vegetated sites would be selected. Areas of highly concentrated bear use such as salmon spawning streams would be avoided.

WETLANDS

All facilities would be sited to avoid wetlands, or if that is not practical, to otherwise comply with Executive Order 11990 (“Protection of Two aspects of trail development would reduce the impacts on vegetation. First, careful route selection would involve at least three steps: (1) mapping general route alternatives and major control points such as cliffs and bogs, (2) close-hover helicopter overflights of route

Wetlands”) and regulations of the Clean Water Act. In areas with sensitive natural resources, such as wetlands, muskeg, or streambanks, increased caution would be exercised to protect these resources from damage caused by construction equipment, erosion, siltation, and other activities with the potential to affect these resources. Measures would be taken to keep fill material from escaping work areas especially near streams or natural drainages.

VEGETATION

For NPS lands or actions involving NPS funds, development sites would be surveyed by a qualified botanist for possible rare plant species. Proposed routes would be relocated or possibly eliminated from further consideration based on these surveys. Vegetation removed during construction would be salvaged to the extent possible for use in restoring areas disturbed by construction.

Whenever possible, trees would be retained and protected from construction-related damage. Trees destroyed during construction would be used for construction material or fuel, or would be disposed of outside park areas by the contractor if feasible.

A disturbed area revegetation plan would be formulated that would require the use of native species. Specifications for soil preparation, native plant/seed mixes, fertilizer, and mulching would be provided for all areas disturbed by construction activities. A monitoring plan would be developed and implemented to ensure revegetation is successful, plantings are maintained, and unsuccessful plant materials are replaced.

alternatives as necessary to select the best option based on assessment of terrain characteristics, control points, and general route feasibility, and (3) ground surveys to refine the trail route where necessary because of terrain or resource concerns. Trails would also be

designed and maintained to discourage social (informal, user created) trail development. Trails would be built along the easiest, most conveniently located routes to specific attractions given the natural terrain. The number of people expected to use the trail would also be considered, and the size of the trail adjusted accordingly to reduce the need for people to step off-trail to let others pass. Various types of barricades could also be used to keep people on designated trails and, thus, reduce the potential for social trails.

The second aspect of trail development needed to reduce vegetative impacts is a commitment to annual maintenance of the trail system. Annual maintenance would reduce the potential for trail deterioration and additional vegetation loss from erosion, groundwater disturbance, trail widening, and slope failure. Maintenance reviews could also determine whether trail modifications are necessary to reduce the number of social trails that have developed or may develop.

For state lands, development in any of the action alternatives would be conducted to minimize disturbance to native vegetation. All disturbed areas would be revegetated unless the landowner specifically requests the area be prepared for natural regeneration of native species. In most cases, revegetation would include native plants. Revegetation plans would be developed in sensitive areas such as wetlands and streambanks and would include monitoring for at least one full growing season. In areas of known rare plant species (i.e., listed as threatened or endangered), development would be avoided if practicable. Individual land managers may apply additional requirements.

WATER QUALITY AND SURFACE WATER RESOURCES

Best management practices would be used during all construction to minimize potential erosion and sedimentation. These practices include measures listed under the subsection on soils below to reduce dust and erosion, and

measures listed under the previous subsection on vegetation to restore native plants in areas exposed during construction. Silt fences and settling ponds would also be in place during construction to protect water quality. Proper siting and treatment of human wastes would occur to ensure levels of nutrients entering the water are minimal.

SOILS

A program to reduce dust and soil loss would be instituted, as appropriate, for all excavation, grading, construction, and other dust-generating and soil-disturbing activities. This program could include (1) sprinkling unpaved construction areas with water to reduce fugitive dust emissions and covering or seeding disturbed areas, as appropriate; (2) imposing speed limits for construction vehicles in unpaved areas; (3) covering trucks hauling dirt and debris; and (4) salvage and reuse of native soils.

Where feasible, local fill material, preferably from the original site, would be used for trail construction activities. Material excavated during trail construction would generally be used as fill in other trail segments or construction areas.

CULTURAL RESOURCES

None of the lands on which the proposed or alternative actions would be undertaken has been surveyed for archeological resources. Because archeological sites and features tend to be relatively discrete, it is believed that most of the actions could be designed to avoid archeological resources. During early design phases, the sites of proposed nature trails, visitor centers, or roadside exhibits would be surveyed to determine the presence, extent, and significance of any previously unknown archeological resources. Every effort would be made to avoid significant resources. **For federal actions**, if avoidance was not feasible, mitigating measures would be developed

according to 36 CFR 800, in consultation with the Alaska State Historic Preservation Office, the Advisory Council on Historic Preservation, If any previously unknown archeological remains were discovered during construction, all work would be halted in the discovery area until the significance of the finding could be determined by cultural resource staff. If protection was not feasible, appropriate mitigation of adverse impacts on those resources would be determined as outlined above. **For state actions**, project planning must comply with state statutes that prohibit the excavation, damage, and removal of archeological and historic resources located on state land without proper permits. All projects should be coordinated through the Alaska Office of History and Archeology. **For borough actions**, as a certified local government, the Matanuska-Susitna Borough would comply with local preservation ordinances and state statutes. If any proposed development would involve direct modification, preservation, or use of a structure or district on or eligible for the National Register of Historic Places, such development would be carried out according to the 1992 *Secretary of the Interior's Standards and Guidelines for Historic Preservation Projects*.

Historically, the south side area fell within the Valdez Creek Mining District. Although there is no additional site survey information to include at this time and no anticipated surveys at or near the south side, there is strong geographical evidence to indicate that historic mining resources may exist throughout the region. In defining the mining context for the area, attention should be given to the geographic place names that allude to mining activities. Equally important will be the understanding of placer mining landscape features that could exist on tributaries and creeks in the

Native American groups, and other interested parties.

area. Isolated features including sluice boxes, dams, piping, and tent frames could exist along placer creeks. Mining landscape features including fill, changes to stream coursing, and tailings could also be found. Survey of these types of features are necessary when the final sites for development are determined. Historic resources associated with parallel activities to mining, including hunting, fishing, and trapping will also require consideration. Many miners pursued these activities to raise cash and supplement sideline mining ventures. Associated property types for these historic land uses can be included in later plans or once the sites for development are determined.

SUSTAINABLE DESIGN PRINCIPLES AND AESTHETICS

The visitor centers and other facilities would be simple in function, reflecting the wild setting. While detailed design solutions would emerge through subsequent analyses and planning, solutions would consider the effects of scale, natural/rustic appearance, materials, color, texture, continuity, furniture, and other issues related to the built environment that would contribute to the visitor experience and minimize visual and natural resource impacts.

Where federal funding is used, all appropriate state-of-the-art water and energy conservation technologies, sustainable practices, and materials recycling would be incorporated into the design of the proposed facilities according to NPS policy on sustainable development practices.

TABLE 1: SUMMARY OF PROPOSED ACTION AND ALTERNATIVES

TOPIC	PROPOSED ACTION	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C (No Action)
<p>GENERAL POLICIES COMMON TO ALL ACTION ALTERNATIVES</p>	<p>Develop lodging, restaurants, and other primarily commercial facilities and services only on private lands (small-scale ancillary food service may be appropriate in some cases on public lands and in public facilities). Encourage construction of full-service campgrounds on private lands.</p> <p>Except in specific development zones highlighted in this plan, protect the wild character of Denali State Park and Denali National Park and Preserve.</p> <p>Design and locate new facilities and uses to minimize impacts on existing uses (e.g., mining, subsistence, wildland recreation).</p> <p>Pursuant to ANILCA, sections 1306 and 1307, and established 1306 implementation policy, the National Park Service is committed to giving priority to the application of Title XIII with regard to federal expenditures for visitor centers, visitor facilities, and services.</p> <p>Phase development in practical and achievable steps.</p>			
<p>ELEMENTS COMMON TO ALL ACTION ALTERNATIVES (* Indicates those actions also common to the no-action alternative)</p>	<p>Develop up to two additional roadside exhibits at existing pullouts along the George Parks Highway.</p> <p>Identify and establish Watchable Wildlife areas along the George Parks Highway and/or the Petersville Road.</p> <p>Develop self-guiding interpretive brochures for portions of the George Parks Highway and the Susitna River.</p> <p>Manage state rights-of-way to maintain safety and protect scenic values, including selective brushing along the George Parks Highway.</p> <p>Review and revise, as appropriate, the Matanuska-Susitna Borough's Special Land Use District currently in place for Denali State Park to improve implementation and enforcement.*</p> <p>Complete borough corridor management plans for the Petersville Road and portions of the George Parks Highway to protect resource values, maintain and enhance the scenic driving experience, and develop community-based recommendations for managing growth in the region.*</p> <p>Work together (the state of Alaska, the National Park Service, the boroughs, and other jurisdictions, as appropriate) to manage recreational activities and other uses of public lands in the area.* (In the no-action alternative, such efforts would continue, but would be less comprehensive and lower priority.)</p> <p>Support the maintenance of mining activities through state land management plan and policies; and work with the mining industry and individual claim holders to address mining issues in the project area, such as RS 2477 rights-of-way, recreational mining proposals, status and shared use of roads, and avoidance/mitigation of conflicts between mining and other land uses.*</p> <p>Consider state scenic byway designation for portions of the George Parks Highway, including the section in Denali State Park, following corridor management planning.*</p> <p>Conduct research in advance of development, as appropriate, on the natural and cultural resources and human uses of the planning area. Studies would have the objectives of providing broad spectrum resource data useful in environmental analyses and in addressing human use issues; providing site-specific resource information for facility design and siting; and filling voids in existing baseline information, particularly as it relates to sensitive species or ecosystem elements.* (In the no-action alternative, general information gathering would continue, but not at the pace, depth, or level of funding that would be anticipated if the site-specific developments described for the action alternatives were to be implemented, especially those along the Petersville Road.)</p>			

TOPIC	PROPOSED ACTION	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C (No Action)
	Formally establish a Denali South Side Plan Implementation Partnership to continue the cooperative partnership approach in implementing the development concept plan.			
GENERAL CONCEPT	<p>Provide visitor facilities and services throughout the south side to meet a wide range of needs and interests of the region's diverse user groups.</p> <p>Visitor facilities would be developed in the Tokositna area near the end of the Petersville Road, along the George Parks Highway, at Chelatna Lake, and in the Dunkle Hills. Development would occur under a logical and cost-effective phasing scheme developed by the Denali South Side Plan Implementation Partnership.</p>	<p>Provide visitor facilities and services within easy access from the George Parks Highway and Alaska Railroad.</p> <p>Primary focus of activity along the George Parks Highway in Denali State Park development zones.</p>	<p>Provide small-scale visitor facilities and services within easy access from the George Parks Highway.</p> <p>Same as alternative A.</p>	<p>Provide visitor facilities and services currently described in existing federal, state, and borough plans that may reasonably be expected to be implemented if this development concept plan is not approved.</p>
VISITOR CENTERS Other Future Visitor Facilities and Services	<p>Construct visitor center (up to 5,000 sf) at Tokositna overlook in Denali State Park (and upgrade/extend the Petersville Road for access).</p> <p>In cooperation and, where desirable, a partnership between the National Park Service, local communities, ANCSA Native corporations, and the state of Alaska, develop visitor facilities and services at Talkeetna, Broad Pass, and in the central development zone of Denali State Park when need and opportunity to do so are established. For the state park central development zone, this would entail constructing a small visitor center (up to 3,000 sf). In cooperation, and where desirable, partnerships for providing additional visitor services along the George Parks Highway may be pursued.</p>	<p>Construct visitor center (up to 13,000 sf) in either northern, central, or southern development zone of Denali State Park.</p> <p>No action.</p>	<p>Construct visitor center (up to 1,500 sf) in either northern, central, or southern development zone of Denali State Park.</p> <p>No action.</p>	<p>Construct a 320-square-foot visitor contact facility near the Alaska Veterans Memorial in Denali State Park.</p> <p>No action.</p>
CAMPGROUNDS	Expand existing Byers Lake campground by up to 25 new sites or develop new	Same as proposed action.	Construct campground up to 25 sites in central development zone of Denali	No campgrounds would be

TOPIC	PROPOSED ACTION	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C (No Action)
	<p>standard campground up to 50 sites elsewhere in central development zone of Denali State Park.</p> <p>Construct up to 50 tent or primitive RV sites in vicinity of proposed Tokositna visitor center.</p> <p>Construct up to 5 primitive fly-in only sites at Chelatna Lake.</p>		State Park.	constructed.
TRAILS	<p>Develop system of short hiking/interpretive trails in the Tokositna visitor center area and longer trails leading through the brush to alpine terrain in Denali State Park and Denali National Park and Preserve, including a possible trail to Long Point.</p> <p>Develop hiking/interpretive trail leading through the brush from Chelatna Lake to alpine terrain in Denali National Park and Preserve. Place information/trail safety sign at trailhead.</p> <p>Develop hiking/interpretive trail in central development zone of Denali State Park if visitor center is not near existing Byers Lake loop trail.</p> <p>Use Dunkle Hills road for new public access opportunities in the Dunkle Hills/Broad Pass area, including access into Denali National Park and Preserve, pending resolution of land status/access issues.</p>	Develop short hiking/interpretive trails around visitor center.	Same as alternative A.	Over the long term, develop a hiking trail to the Chulitna River in the southern development zone of Denali State Park. Develop snowmachine user parking lot and associated sanitary facilities on Matanuska-Susitna Borough land near the Forks Roadhouse along the Petersville Road.
PUBLIC USE CABINS	<p>Construct up to 4 public use cabins (sleeping 4–6 people each) on state land in vicinity of Tokositna visitor center, near proposed public campground.</p> <p>Construct up to 2 fly-in only public use</p>	No public use cabins would be constructed.	Same as alternative A.	<p>Convert existing privately built (trespass) cabin to public use on Chelatna Lake.</p> <p>Construct 4 public use cabins on the</p>

TOPIC	PROPOSED ACTION	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C (No Action)
	cabins (sleeping 4–6 people) on state land around Chelatna Lake.			east side of the Chulitna River in Denali State Park (sleeping 4–6 people).

TABLE 2: SUMMARY OF IMPACTS OF THE PROPOSED ACTION AND ALTERNATIVES

IMPACT TOPIC	PROPOSED ACTION	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C (NO ACTION)
Vegetation	<p>An estimated 143 to 217 acres of vegetation would be lost or disturbed as a result of construction of the proposed developments. Increased development and use on the south side would also cause an additional unknown amount of vegetation disturbance or loss through brushing and vista clearing, the development of user-made trails and informal campsites, and due to increased off-road vehicle use and spin-off development of other lands. Considering that the vegetation classes extend over several million acres in the planning area, and the commitment to avoid, wherever possible, construction on sensitive areas like wetlands, the loss of this acreage is not considered a significant impact on vegetation.</p>	<p>The types of impacts on vegetation would be the same as the proposed action, except that about 20 to 54 acres of vegetation would be lost or disturbed under this alternative.</p> <p>Although an unknown amount of vegetation could be lost due to spin-off development on the south side, this amount would likely be less than under the proposed action. This would also be the case for other resources discussed below.</p>	<p>Impacts on vegetation would be the same as under the proposed action, except that from 13 to 45 acres of vegetation would be lost or disturbed.</p> <p>No spin-off development would be expected to result from actions taken under this alternative; therefore, there would be no related impacts on vegetation or other resources discussed below.</p>	<p>A minimal amount (about 7 acres) of vegetation would be lost or disturbed by state- and borough-constructed developments under this alternative. Considering that the vegetation classes extend over several million acres in the south side study area, the loss of this amount of vegetation is not considered a significant impact.</p> <p>No spin-off development would be expected to result from actions taken under this alternative; therefore, there would be no related impacts on vegetation or other resources discussed below.</p>
Bears	<p>From 127 to 167 acres of prime grizzly habitat and from 16 to 50 acres of general grizzly habitat would be lost or disturbed. The entire 143 to 217 acres would also be considered a loss of general black bear habitat. Bears could also indirectly lose habitat if they are displaced due to proposed actions. Due to the widespread availability of bear habitat within the region, the loss of this amount of habitat is not expected to substantially impact bear populations. Increased human presence in the area could also lead to more frequent bear/human confrontations and contribute to higher levels of bear mortality, adversely impacting individual bears, but not significantly impacting the regional bear population. Measures would be taken to minimize these impacts.</p>	<p>From 20 to 54 acres of general grizzly bear habitat would be lost or disturbed; no prime grizzly habitat would be lost. The 20 to 54 acres would also be considered a loss of general black bear habitat. This loss would not be expected to substantially impact bear populations. The potential for bear/human confrontations and bear mortality would also increase, but to a lesser degree than the proposed action because developments would not be in prime bear habitat, nor would the level of development and access or the associated human use of the area be as extensive.</p>	<p>From 13 to 45 acres of general grizzly and black bear habitat would be lost or disturbed as a result of facility siting. This loss is not expected to substantially impact bear populations because habitat is abundant throughout the south side. The potential for bear displacement and bear/human confrontations would be minor because facilities would be small-scale, and associated visitation would not increase significantly over current trends. Bear mortality would increase slightly, but to a lesser degree than either the proposed action or alternative A because of the lower level of access and development, as well as associated human use. Significant impacts on bear populations or habitat would be very unlikely.</p>	<p>A minor amount (about 7 acres) of general grizzly and black bear habitat would be lost or disturbed under this alternative as a result of facility siting, and few if any bears would be displaced due to the loss. Bear populations would not be affected substantially because bear habitat is abundant throughout the south side and because the facilities would be small scale, attracting relatively few additional visitors to the area. The probability of bear/human confrontations and human injury would be minimal, as would the potential for poaching and harassment of bears. Bear mortality would increase slightly due to facilitated access of hunters on snowmachines during the spring hunting season.</p>

IMPACT TOPIC	PROPOSED ACTION	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C (NO ACTION)
Caribou	<p>Loss of caribou habitat due to the proposed action would be minimal (about ½ acre). An unknown amount of habitat could be lost due to spin-off development on the south side. At current population levels, impacts on caribou from recreational use of the Dunkle Hills area would be minimal because recreation access and use of the Cantwell calving grounds in May would be limited by snow conditions and calving in this area is low. In addition, caribou do not generally use the Dunkle Hills area during the peak summer recreation season. In the fall and winter, though caribou may be adversely impacted by increased recreational and subsistence use, no long-term impacts on populations would be expected. However, at historic caribou population levels, with large numbers of animals using the grounds, a concurrent increase in human use of the Dunkle Hills area could raise the potential for human/caribou interactions, thus increasing the frequency of caribou disturbance by humans, which could cause displacement of caribou. Management actions could minimize or prevent these impacts.</p>	<p>No adverse impacts on caribou populations or habitat would be expected, as no facilities would be developed in caribou habitat.</p>	<p>Same as alternative A.</p>	<p>Same as alternative A.</p>
Moose	<p>From 143 to 217 acres of general and winter moose habitat, including from 122 to 162 acres of critical winter range, would be lost or disturbed. An unknown amount of habitat could be lost due to spin-off development on the south side. Moose could also indirectly lose habitat if they are displaced due to proposed actions. This loss of habitat would not be expected to impact the moose population because moose</p>	<p>From 20 to 54 acres of general moose habitat and from 10 to 39 acres of winter range would be lost or disturbed. This loss of general and critical moose habitat associated with development and related human use would not be expected to impact moose populations because habitat is abundant throughout the south side. Increased development and human activity would cause some</p>	<p>From 13 to 45 acres of general habitat and from 7 to 36 acres of winter range could be lost as a result of development and related human use. However, this loss would not be expected to impact moose populations because habitat is abundant throughout the south side. Indirect habitat loss due to displacement would also occur, but it would be lower than that under the proposed action and alternative A</p>	<p>About 7 acres of general and winter moose habitat would be lost or disturbed as a result of facility siting; however, this loss would not substantially impact moose populations because such habitat is abundant throughout the south side. Displacement of moose from winter habitat and moose harassment may increase slightly above current levels, but mortality from hunting would not be expected to be affected.</p>

IMPACT TOPIC	PROPOSED ACTION	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C (NO ACTION)
	<p>habitat is abundant in the area. Improved access along the Petersville Road could increase hunting pressure in an area that is already heavily</p>	<p>displacement of moose and increase the potential for incidents of moose harassment. However, the degree of impact would be less than in the proposed action because</p>	<p>because the level of development would be smaller and more concentrated, attracting fewer visitors. There would not be a greater potential</p>	
Moose (cont.)	<p>hunted. Improved access along the Dunkle Hills road area would increase nonsubsistence and subsistence hunting pressure in this area. Increased human use of the south side could lead to more frequent incidents of moose harassment, resulting in stress to individual animals, but probably not significantly affecting the regional moose population.</p>	<p>development and access would be less extensive under alternative A.</p>	<p>for moose harassment or moose mortality due to hunting.</p>	
Wolves	<p>From 143 to 217 acres of wolf habitat would be lost or disturbed due to facility siting. An unknown amount of habitat could be lost due to spin-off development on the south side. This loss of habitat would have little direct impact on wolf populations in the area. If wolves are forced to abandon certain areas due to human use, this indirect impact would be greater on wolves than the direct loss of habitat. However, such indirect impacts would not be expected to affect regional wolf populations significantly.</p>	<p>From 20 to 54 acres of wolf habitat would be lost or disturbed. Habitat loss from facility siting would have little direct impact on wolf populations in the area. Indirect loss of habitat resulting from facilities and associated human use could force wolves to abandon certain areas, but to a lesser degree than under the proposed action. It is unlikely that regional wolf populations would be greatly impacted.</p>	<p>From 13 to 45 acres of wolf habitat would be lost or disturbed due to facility siting. Development would be small-scale, and resulting increases in visitation to the south side would not be significantly above existing trends. The direct and indirect habitat loss from facility siting and associated human use would not significantly impact wolf populations in the area.</p>	<p>About 7 acres of wolf habitat would be lost or disturbed. Habitat loss from actions taken under this alternative would not significantly impact wolf populations in the area. Individual wolves may be adversely affected to a small degree by increased human presence in the vicinity of the Forks Roadhouse, although again, no significant impacts on regional wolf populations would be expected..</p>
Trumpeter Swans	<p>Development of recreation facilities and increased visitor use in the Tokositna area, central development zone of Denali State Park, and Chelatna Lake area, would not be expected to have a significant impact on trumpeter swans due to habitat avoidance and measures to minimize human interaction with swan populations. An unknown amount of habitat could be lost due to spin-off development on the south side.</p>	<p>Development of recreation facilities and increased visitor use along the George Parks Highway, primarily within Denali State Park, would not be expected to have a significant impact on trumpeter swans due to habitat avoidance and measures taken to minimize human interaction with swan populations.</p>	<p>Development of recreation facilities would not affect trumpeter swans directly because these facilities would not be sited in sensitive swan habitat. Development would be small-scale with insignificant associated increases in visitation; therefore, no indirect impacts on swans (e.g., disturbance by people) would be expected. Additionally, measures would be taken to reduce or eliminate potential disturbance by the few people who do</p>	<p>There may be a loss of a minor amount (about 7 acres) of potential trumpeter swan habitat under this alternative depending on where facilities were sited. Indirect disturbance of swans may rise slightly due to increased human presence in the vicinity of these developments.</p>

IMPACT TOPIC	PROPOSED ACTION	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C (NO ACTION)
			visit the area.	
Fish	<p>The proposed action would lead to an increased number of anglers using local streams, potentially adversely impacting the aesthetic experience of fishing for some people; however, fish populations would not be directly impacted by increased visitation, due to expected adjustments in seasons and catch limits by the state.</p> <p>Fish populations may be impacted indirectly through degradation of habitat associated with facility siting, spin-off development, and increased recreational use of the area. The precise level of impact on fish habitat would be determined when site-specific location and design details for the proposed facilities are developed; however, measures would be taken to ensure that impacts remain minimal.</p>	<p>This alternative would likely lead to an increase in local fishing pressure (though not as much as under the proposed action); increased fishing pressure on local streams, rivers, and lakes could possibly adversely affect the aesthetic experience of fishing for some people. Fish populations would not be directly impacted by increased visitation due to adjustments in seasons and catch limits as necessary by the state.</p> <p>Fish populations may, however, be impacted indirectly through degradation of habitat associated with facility siting and increased recreational use of the area. Again, the impact would be less extensive than under the proposed action. The precise level of impact on fish habitat would be determined when site-specific facility design and location details for the proposed facilities are developed. However, measures would be taken to ensure that impacts remain minimal.</p>	<p>Development would be small-scale and resulting visitation to the south side would not increase significantly above existing trends. Thus, there would be no impacts on local fishing pressure.</p> <p>Impacts on fish populations as a result of possible habitat degradation due to facility siting would potentially be minor.</p>	<p>Trail development to the Chulitna River may increase local fishing pressure slightly, potentially adversely impacting the aesthetic experience of fishing for some visitors.</p> <p>Impacts on fish populations from habitat degradation resulting from developments would likely be minor.</p>
Threatened, Endangered, or Sensitive Species	<p>The American peregrine falcon is the only federally endangered species that may occur on the south side. Several federal and state species of concern may be present, as well. Surveys conducted as part of subsequent environmental analysis would determine for certain whether these species inhabit the study area. Consultation with the U.S. Fish and Wildlife Service regarding such</p>	<p>As under the proposed action, measures developed as part of continuing consultation with the U.S. Fish and Wildlife Service would ensure that any listed species or species of concern found to occur in the study area would not be affected by actions taken under alternative A. Therefore, under this alternative, no impacts would be expected on these</p>	<p>As with the proposed action and alternative A, no impacts would be expected on listed species or species of special concern because measures would be developed in consultation with the U.S. Fish and Wildlife Service to avoid such impacts.</p>	<p>As with the action alternatives, no impacts would be expected on listed or species of special concern.</p>

IMPACT TOPIC	PROPOSED ACTION	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C (NO ACTION)
	<p>species would continue. Measures developed as part of this consultation would ensure that any of these species found to occur in the study area would not be affected by the proposed action. Therefore, under this proposal, no impacts would be expected on listed species or species of concern.</p>	<p>species.</p>		
<p>Threatened, Endangered, or Sensitive Species (cont.)</p>	<p>An unknown amount of habitat for the Tule greater white-fronted goose, considered a species at risk by the International Waterfowl Research Bureau, may be lost due to spin-off development, although not from construction of proposed facilities themselves. Additionally, increased recreational use associated with the proposed facilities may disturb the geese, possibly causing some to abandon habitat. However, measures taken as part of the proposed action would reduce or eliminate the likelihood of such disturbance.</p>	<p>An unknown amount of habitat for the Tule greater white-fronted goose, considered a species at risk by the International Waterfowl Research Bureau, may be lost due to spin-off development resulting from actions taken under alternative A, although not from the actual facilities constructed under this alternative. However, the amount of spin-off development, and, hence the loss of goose habitat, would not be as high under alternative A as under the proposed action. Increased recreational use associated with proposed facilities may disturb the geese, possibly causing some to abandon habitat. However, measures would be taken as part of alternative A to reduce or eliminate the likelihood of such disturbance.</p>	<p>Actions taken under alternative B would not impact the Tule greater white-fronted goose, a species considered at risk by the International Waterfowl Research Bureau, because no facilities would be constructed in goose habitat. Additionally, increases in visitation to the south side due to actions taken under this alternative would not be significant and, thus, would not result in indirect impacts on geese such as increased disturbance by people.</p>	<p>Actions taken under this alternative may minimally impact the Tule greater white-fronted goose (a species considered at risk by the International Waterfowl Research Bureau), due to habitat loss and disturbance from construction of visitor facilities and associated use.</p>
<p>Air Quality</p>	<p>Short-term impacts on air quality, such as dust and vehicle emissions from construction-related activities, would be intermittent and temporary, and occur during construction of each of the project phases, as well as while improved sections of the Petersville Road remain unpaved. While long-term impacts on air quality cannot be quantified at this time, it is likely that the proposed action would adversely impact air quality in the Petersville Road area to a greater extent than that which would occur if the proposed</p>	<p>Dust and vehicle emissions from construction-related projects would be intermittent and temporary, lasting only during construction. Impacts on air quality would be less than under the proposed action, primarily because there would be less development (e.g., Petersville Road construction) and less vehicle emissions associated with incremental increases in visitation. While long-term impacts on air quality cannot be quantified at this time, it is likely that air quality impacts under this alternative would be a small</p>	<p>Siting of visitor facilities would slightly impact air quality in the vicinity of the developments by increasing levels of pollutants (e.g., dust and vehicle emissions) in the air during construction stages. Increases in these forms of pollution would be intermittent and temporary, lasting only during construction. Visitation to the south side would not be expected to increase significantly above existing trends, nor would the corresponding traffic levels. For this reason, no long-term impacts on air quality would be</p>	<p>Siting of visitor facilities would slightly impact air quality in the local vicinity of the facilities by increasing levels of pollutants in the air during construction stages. Increases in these forms of pollution would be intermittent and temporary, lasting only during construction and having no long-lasting effects. Construction of a parking area near the Forks Roadhouse would likely have only minimal temporary impacts on air quality areawide, but use of the parking lot could have more minor, localized impacts because vehicles</p>

IMPACT TOPIC	PROPOSED ACTION	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C (NO ACTION)
	actions were not implemented. Air quality impacts from proposed developments and associated human use would likely be minor throughout the rest of the south side compared to the effects of other existing or future south side actions.	fraction of those resulting from other existing or future south side actions.	expected from this alternative.	would be concentrated there.
Water Quality	Construction and siting of visitor facilities and associated road improvements, as well as recreational use, could impact water quality by causing increases in sedimentation and turbidity, alteration of waterflow and hydro- patterns, and contamination of the water with pollutants and additional nutrients. Most water quality impacts would be temporary, lasting only during construction, and these would be minimized through adherence to best construction practices. Likewise, measures would be taken to minimize any longer-term impacts on water quality.	There would be a temporary reduction of water quality, particularly during construction stages, but measures would be taken to minimize effects on water quality and water-dependent resources. Overall, impacts would be across a smaller area than under the proposed action and be concentrated along the George Parks Highway in Denali State Park.	Siting and construction of visitor facilities may result in a temporary reduction of water quality; however, these impacts would be over a smaller area than either the proposed action or alternative A. Impacts related to human use would likely be minimal as visitation would not increase significantly above existing trends. Measures would be taken to minimize effects on water quality and water-dependent resources.	The types of impacts on water quality would be the same as described for the action alternatives, but the magnitude would be less. Overall, impacts on water quality would be minimal and mostly temporary, lasting during construction of visitor facilities.
Archeological Resources	The proposed action would not affect any known archeological sites, and if archeological resources were encountered during more detailed site planning or construction, facility relocation or mitigation would provide for acceptable protection.	Same as proposed action.	Same as proposed action.	Same as proposed action.
Historic Resources	The proposed action would not affect any known historic resources.	Same as proposed action.	Same as proposed action.	Same as proposed action.
Subsistence	The proposed action would not result in a significant restriction of subsistence users. The small acreage required for constructing facilities and hiking trails should not significantly impact fish and wildlife resources used for subsistence purposes and subsistence activities. The influx of	No significant impacts would be anticipated on existing subsistence use activities or populations of fish and wildlife upon which subsistence users are dependent. Access of subsistence users to natural resources should not be affected.	Same as alternative A.	There would be no impacts on subsistence users or on subsistence resources.

IMPACT TOPIC	PROPOSED ACTION	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C (NO ACTION)
	<p>visitors and the population growth in local communities may create competition for subsistence resources in the Skwentna area, adjacent game units, and Cantwell due to the Petersville Road upgrade and Tokositna development and improved access in the Dunkle Hills.</p>			
<p>Matanuska-Susitna Borough Economy and Social Environment</p>	<p>There would be direct and indirect benefits, mostly during summer, to Matanuska-Susitna Borough residents from improved road and park use facilities and employment and income-producing opportunities for local residents. Economic benefits would mostly accrue to residents within easy commute range or located at the sites of new facilities. There would be increased operation and maintenance costs for the improved facilities.</p> <p>Population in-migration could occur as a result of increased demand for seasonal workers during construction and operations. In addition, there would be some increase in population due to private business expansion in the area as a result of the proposed action. Housing for seasonal workers might be provided in camp-like facilities (such as cabins) or group facilities (such as dormitories, kitchen and dining halls, etc). Some housing might be available from the existing housing stock, but more likely there would be a need to develop additional employee housing. The Alaska Department of Transportation and Public Facilities does not directly provide construction worker housing. However, in outlying areas, contractors typically provide RV camps built to</p>	<p>There would be direct and indirect benefits to Matanuska-Susitna Borough residents from park facilities and employment and income-producing opportunities for local residents. The latter would mostly accrue to residents within easy commute range or located at the sites of new facilities. Some residents seeking a rural lifestyle may be affected by the changes.</p>	<p>There would be modest direct and indirect benefits to Matanuska-Susitna Borough residents from park facilities and employment and income-producing opportunities for local residents. The latter would mostly accrue to residents within easy commute range or located at the sites of new facilities.</p>	<p>There would be minimal direct and indirect income effects from increased spending on lodging, transportation, food, fuel, etc. in the Matanuska-Susitna Borough. These would be less under than the action alternatives because only minor additions to publicly provided visitor facilities or services would be developed under this alternative.</p>

IMPACT TOPIC	PROPOSED ACTION	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C (NO ACTION)
	<p>appropriate standards for use by road construction workers.</p> <p>Adverse land use effects could occur unless certain land use actions are taken by the Matanuska-Susitna Borough and other transportation corridor protections are instituted by the state of Alaska and the borough with the active participation</p>			
<p>Matanuska-Susitna Borough Economy and Social Environment (cont.)</p>	<p>of the local community. In addition, borough land disposal programs could include conveyance restrictions. Municipal service impacts would likely be adverse; ambulance and fire protection services would need to be upgraded and developed. Quality of life changes would be positive for those interested in increased availability of local jobs and earnings. For those interested in maintaining a sense of remoteness and a quiet rural atmosphere, the perception may be of a degraded quality of life. Residents of south-central Alaska would benefit from improved access for recreational purposes.</p>			
<p>Trapper Creek and Petersville Economies and Social Environment</p>	<p>Local Trapper Creek and Petersville residents would benefit from better park facilities and enhanced economic opportunities. The analysis assumes sufficient land use controls would be in place prior to major development to minimize undesirable strip development. There may be impacts on the quality of the backcountry experience of both local residents and visitors, due to enhanced access and slightly expanded use, particularly during winter; possible loss of the sense of remoteness and natural qualities that are important for existing</p>	<p>Trapper Creek residents could realize economic benefits from the construction and operation of a visitor center in the state park. Building the visitor center in the southern or central development zone in Denali State Park could increase visitation to the community. Some Trapper Creek residents might see the increase in visitation and related employment and income as an advantage to their community. While others might see it as a decline due to the negative impacts associated with increased demand for municipal facilities and</p>	<p>Trapper Creek residents could benefit modestly from job and income-producing opportunities associated with constructing and operating a small visitor center.</p>	<p>See impacts on Matanuska-Susitna Borough above.</p>

IMPACT TOPIC	PROPOSED ACTION	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C (NO ACTION)
	residents and others who come to the area; possible loss of the rural community atmosphere and lifestyle; and possible increased demand for municipal facilities and services, especially fire and ambulance services.	services, especially fire and ambulance services, and possible loss of the rural lifestyle and community atmosphere, as well as the remote, natural qualities of the area that attracted many people to live there..		
Talkeetna Economy and Social Environment	Overall, since no south side facilities are proposed for Talkeetna, adverse impacts would be minimal and concentrated during the summer. Talkeetna residents would experience additional job and income-producing opportunities associated with general regional increases in visitation under the proposed action, mostly during summer. Municipal services would be impacted slightly. Minimal impacts would be expected on land use and quality of life. Along with baseline growth, some increased summer traffic and pedestrian congestion at private and public facilities would likely result.	Talkeetna residents would benefit from job and income-producing opportunities associated with increased visitation. Municipal services would be impacted only slightly. Baseline growth is likely to cause more traffic and pedestrian congestion at private and public facilities would likely result, which could lead to loss of the rural, small community atmosphere, and alternative A would contribute some incremental growth to this.	Talkeetna residents could benefit modestly from some job and income-producing opportunities associated with constructing and operating a small visitor center.	See impacts on Matanuska-Susitna Borough above.
Denali Borough Economy and Social Environment	Some small but important long-term, regional employment opportunities would be created in the Denali Borough as a result of additional use and development on the south side of Denali, such as the small visitor center in Denali State Park and improved access to the Dunkle Hills. Some indirect benefits would be likely for merchants supplying goods and services to visitors in the area. There would be increased traffic and economic activity associated with tourism, with associated impacts on the rural community lifestyle.	Some small and minimal long-term employment opportunities would be created in Denali Borough as part of developing a large visitor center in Denali State Park, if the facility were located in the northern development zone. Some indirect benefits would be likely for merchants supplying visitors to a Denali State Park visitor center. Some borough residents might welcome the increased economic activity associated with increased tourism; others might not.	Minimal employment opportunities would be created as part of developing a small visitor center	There would be minimal or no economic impacts on Denali Borough or communities therein.
Cantwell Economy and Social	Minimal socioeconomic impacts are anticipated in the Cantwell area, mostly because of the relatively long	Because of the distance from the identified locations for a new visitor center, the Cantwell community would	Minimal employment opportunities would be created as part of developing a small visitor center in Denali State	See impacts on Denali Borough above.

IMPACT TOPIC	PROPOSED ACTION	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C (NO ACTION)
Environment	distances between the community and the Tokositna area of Denali State Park. Some small, but relatively important employment opportunities would be created as a result of additional use and development in other areas of the south side, such as the small visitor center along the George Parks Highway in Denali State Park. Some indirect effects could result from increased visitor expenditures as visitors pass through the Cantwell area on their way to other destinations.	likely receive only minimal direct impacts Some indirect benefits would be likely for merchants supplying goods and services to visitors in the area.	Park for which Cantwell residents might qualify. Some indirect benefits would be likely for merchants supplying visitors to the south side visitor center.	
Visitor Use – Denali State Park and Denali National Park and Preserve	Opportunities for visitation to the south side would be enhanced and expanded. First-time visitors, those traveling in organized tours or as family groups, and Alaska residents would have increased recreational and interpretive opportunities. Potential increased development activity on private lands, especially along the Petersville Road between Trapper Creek and the Forks Roadhouse (about mile 19), might impact the visual and aesthetic quality of a portion of the road corridor. Upgrading the Petersville Road would improve access and result in increases in other recreational uses, although the road would not be maintained beyond the Forks Roadhouse in winter.	Opportunities for visitation to the south side would be enhanced and expanded due to development of a large visitor center along the George Parks Highway in Denali State Park, although trail access to Denali National Park and Preserve would not be achieved under this alternative. Roadside interpretive waysides, short trails, and day use facilities would also add to the south side park experience. Increased development activity might occur on private lands, although instituting stricter land use controls (assumed for each of the action proposals) would reduce potential adverse impacts on the visual and aesthetic quality of the road corridor.	Opportunities for existing and future visitors would be expanded due to development of a small visitor center and related facilities in Denali State Park, but less than for the proposed action or alternative A	Interpretive and recreational opportunities for future visitors would be similar to those at present, with a minimal number of new public facilities developed under this alternative. Of note is the Matanuska-Susitna Borough's intent to construct a parking lot at the Forks Roadhouse for snowmachine users. Visitation would be increased by these developments to some extent as well as by normal increases in Alaska population associated with economic growth and statewide increases in visitation.
Visitor Use – Denali State Park and Denali National Park and Preserve (cont.)	Residents from south-central Alaska would benefit from improved access to the area. There would be increased congestion and accidents from increased vehicle traffic, particularly between the George Parks Highway cutoff and mile 19 (Forks Roadhouse) on the Petersville Road, and noise associated with increased snowmachine use in the area.			

IMPACT TOPIC	PROPOSED ACTION	ALTERNATIVE A	ALTERNATIVE B	ALTERNATIVE C (NO ACTION)
	<p>Increased hunting and fishing pressure could also lead to reductions in seasons and bag limits by the state, which could also contribute to displacement of use. The Alaska Boards of Game and Fisheries would continue to manage hunting and fishing to maintain healthy fish and wildlife populations. In addition, public safety concerns in the immediate vicinity of visitor centers, campground, and trailheads could lead to small areas being closed to the discharge of firearms. Establishment of a few discreet watchable wildlife areas along the Petersville Road or George Parks Highway could also lead to small hunting closures by the Alaska Board of Game following public involvement. In general, hunting would remain an important activity through the south side on state and borough lands.</p>			

AFFECTED ENVIRONMENT

PHYSICAL ENVIRONMENT

PHYSIOGRAPHY

The south side study area is dominated by Mount McKinley (North America's highest peak at 20,320 feet) and the other high peaks of the Alaska Range including Mount Foraker (17,400 feet) and Mount Hunter (14,573 feet). Generally aligned east-west, the Alaska Range represents one of the most dramatic mountain uplifts in North America. The central portion of the range is rugged; it has spawned several large and long glaciers including the Eldridge, Ruth, Tokositna, Kahiltna, and Yentna. These glaciers range between 35 and 45 miles in length and are up to 4 miles in width.

The lower southern slopes of the Alaska Range are generally quite steep between the glaciers and contain some spectacular lower elevation walls, spires, and peaks of their own. Examples include the granitic spires of the Tokoshas between the lower ends of the Tokositna and Ruth glaciers and the towering granitic walls on the west side of Cripple Creek north of Chelatna Lake. Near the terminus of each of the glaciers the terrain is more gentle, with rolling tundra-covered hills extending into the lowlands associated with the Chulitna and Susitna rivers.

The Susitna River system drains the south side southeast of Broad Pass. The major tributaries of the system include the Chulitna, Hidden, Coffee, Ruth, Tokositna, Kahiltna, and Yentna rivers. Generally these rivers are wide, braided, and loaded with silt, which is typical of glacially fed streams.

GEOLOGY

The extreme vertical relief of the Alaska Range has resulted from the collision of the Pacific and Continental crustal plates. As the Pacific plate continues to push northward it lifts the
Most mineral resources in the region are south of Broad Pass and include coal, copper, arsenic, gold, silver, tin, molybdenum, lead, and zinc.

Continental plate. Related ancient volcanic activity has added to the form and mass of the mountains.

The substrate below the south side is composed of igneous, metamorphic, and sedimentary rocks ranging in age from relatively recent to Precambrian. Longitudinal faults, the principal one being the McKinley Strand of the Denali fault System, run parallel to the east-west trend of the range. These faults are characterized by linear valleys, low passes, and generally easily traversed terrain. Recent seismic data (1990–1995) indicates little activity along the course of the fault trace, with most events occurring near the base of Mount McKinley in low magnitudes. Statistics from 1994 seismic data compiled for Denali National Park indicate that epicenters of four of the top ten earthquakes that year were located under the Ruth Glacier and ranged in magnitude (Richter scale) from 3.9 to 4.4. Eldridge Glacier and Kahiltna Glacier were also the epicenter locations of “top ten” movements, with magnitudes of 3.8 and 3.7 on the Richter scale, respectively. Triangulation survey monuments were established on each side of the McKinley Strand of the Denali Fault System about 12 miles east and west of Cantwell in 1982. Resurveys over various years up to 1992 have demonstrated no appreciable movement since 1982. However, an eight-year data set is not a significant time period for detection of slow strain slip rates, and certainly not indicative of the possibility of either a minor or major rupture (NPS 1996c).

The lowlands of the Chulitna/Susitna Valley are covered by ground moraines, drumlin fields, eskers, and glacial outwash plains. The soils in the lowlands are generally poorly drained and support shallow-rooted trees and large areas of muskeg vegetation.

The Golden Zone mine, in the headwaters of the West Fork of the Chulitna River, produced gold, copper, and silver in the 1930s. It is not

currently producing, but is in a pre-production phase with plans to open in the future. The Dunkle Mine, which is in the same general area, produced coal for about 10 years following World War II. Gold placer mining and exploration occur in the Cache Creek area near Petersville.

SOILS

South side soil conditions are very complex; these conditions, including the location of permafrost, can be mapped in detail only after specific sampling and analysis. Unless otherwise noted, the following soils information is from the *Denali State Park Master Plan* (ADNR 1989), which itself was based primarily on a generalized review of Denali State Park soils completed by the Soil Conservation Service in 1979.

Seven major soil types are found within Denali State Park:

- EA2 - Outwash plain
- RM1 - Rough mountainous
- SO1 - Loamy, near level
- SO9 - Loamy, hilly
- SO10 - Gravelly, steep
- SO13 - Gravelly, mountainous
- SO17 - Very gravelly, mountainous

The southern development zone of the park is composed primarily of EA2 (northwest section of the zone west of the George Parks Highway), SO10 (area east of the George Parks Highway), and SO1 (remainder of the zone west of the George Parks Highway) soils. Of these, areas composed of SO1 and SO10 soils are generally suitable for development from a soils standpoint; areas with EA2 soils should not be considered for development due to possible river flooding and/or glacial outburst flooding. Both the central and northern development zones are composed of SO10 soils and are, therefore, suitable for development.

Soils in the Tokositna area were examined in more detail in the *1979 Soils of the Tokositna Soils Survey Area, Alaska* (USDA 1979). The study area consisted of about 9,700 acres in a strip 2 miles wide and 6 miles long, extending about 2.5 miles from the lower end of the Tokositna Glacier east and west along the south bank of the Tokositna River. Soils were investigated to a depth of 40 inches in this study. Seven soil associations were described for the Tokositna area and rated in terms of limitations for urban and recreation development (see table 3); these are presented below. Most of the Tokositna area is composed of TM soil associations laid out in strips .25 mile to 1 mile wide and .5 mile to 4 miles long.

TABLE 3: SOIL ASSOCIATIONS AND LIMITATIONS FOR DEVELOPMENT

Soil Associations	Limitations for Urban Development	Limitations for Recreation Development
a - Cryaquents-Borohemists	Very severe	Moderate to very severe
EO - Cryorthents-Cryorthods	Very severe	Very severe
RM - Rough Mountainous Land	Very severe	Very severe
TM1 - Talkeetna-Mutnala 1	Moderate	Moderate to severe
TM2 - Talkeetna-Mutnala 2	Severe	Moderate to severe
TM3 - Talkeetna-Mutnala 3	Very severe	Severe to very severe
TM4 - Talkeetna-Mutnala 4	Very severe	Very severe

Moderate: Limitations need to be recognized, but can be overcome.

Severe: Limitations are difficult to overcome, but not impossible.

Very severe: Limitations are ordinarily not economically feasible to overcome.

CLIMATE

The south side is in a transition zone between the maritime climate of Cook Inlet (Anchorage) and the continental climate to the north. The Alaska Range greatly influences the climate of the area by blocking much of the moisture that originates in the Gulf of Alaska as it sweeps inland. On the south side of the range the climate is much wetter, with two to three times the precipitation of the north side.

There are few weather stations on the south side that record temperature variations. Temperatures at Talkeetna generally range between 44°F and 68°F in the summer and between 0°F and 40°F in the winter, although temperatures as low as -48°F and as high as 91°F have been recorded. The higher elevations closer to the Alaska Range are much colder. Temperatures as low as -70°F have been recorded on the slopes of Mount McKinley.

Snowfall in Talkeetna usually exceeds 100 inches during the winter. Snowfall greatly increases farther to the north and west, exceeding 400 inches per winter in some locations south of the Alaska Range. Avalanches on the south side are numerous each winter. Resulting avalanche tracks are very wide and may extend all the way to the bottom of stream valleys. Avalanche tracks are often active well into the summer months.

AIR QUALITY/VISIBILITY

Regional air quality data for the south side are unavailable. If available, such data would provide baseline information on the status of air quality on the south side and would allow for a more quantitative determination of impacts. Air quality data has, however, been collected from sampling stations located north of the Alaska Range in Denali National Park and Preserve. The national park participates in three national sampling programs: the National Atmospheric Deposition Program, which was set up to monitor acid precipitation; a National Park The potential for clear views of Mount McKinley from the south side is greatest from

Service ozone monitoring program; and the Interagency Monitoring of Protected Visual Environments program, which collects particulate samples and analyzes them for mass, elemental, and organic carbon, SO₂, NO₃, and elements Na — pb, H, N, and PM₁₀ mass.

National ambient air quality standards (NAAQS) are established by the Environmental Protection Agency under the Clean Air Act for various air pollutants; these standards are applied nationwide and are not to be exceeded. No violations of NAAQS have been documented within Denali National Park and Preserve (EPA 1994).

Denali National Park and Preserve is a designated class I airshed. This classification scheme was established by Congress to protect air quality and facilitate implementation of the Clean Air Act. A class I area receives the highest degree of protection and allows only limited degradation of air quality. For these areas more stringent standards — called increments — are applied for certain air pollutants (i.e., sulphur dioxide, nitrogen dioxide, and fine particulates) to prevent significant deterioration of air quality in class I airsheds. Based on available data, it is unlikely that these increments have been exceeded at Denali National Park and Preserve.

Mount McKinley is the dominant landscape feature of the region. On a clear day it can easily be seen from both Anchorage and Fairbanks, which are 350 miles from each other. The George Parks Highway provides the most accessible close-up views of the mountain. The highway segment closest to the mountain is near the south boundary of Denali State Park. Here the mountain is still more than 40 miles away, but this is one of the few locations along the highway that reveals the mountain's scale and mass. In many locations closer to the mountain only portions of the massif can be seen at one time.

January to April. During the summer months, views of Mount McKinley from the south are

usually obscured by clouds. The Summit weather station, near Broad Pass, reports an average of eight clear days per month during June, July, and August; however, even on these clear days the summit of Mount McKinley may be obscured by localized clouds that form nearly every afternoon. However, records dating back at least a decade indicate that the summit of Mount McKinley is generally visible for a portion of the day on over half of the days from May through August from Chuvana Lake, 42 miles southeast of the summit of Mount McKinley (ADNR 1995a).

WATER RESOURCES

Surface Waters

The surface water system on the south side is extensive. The south side contains several major rivers within its boundary, including the Susitna, Talkeetna, Kahiltna, Chulitna, and Tokositna. The latter three rivers originate from glaciers and have the typical characteristics of glacial runoff: peak flows in midsummer, distinct day-to-night differences, a large silt content, and occasional floods (ADNR 1980). There are also numerous small and moderately sized lakes and both glacial and clearwater streams on the south side.

Flood records are not available for the Tokositna area, the Denali State Park development nodes, Chelatna Lake, or the Dunkle Hills road. However, a topographic and vegetative analysis during a 1980 site investigation of the Tokositna area indicated that structures built in the valley could be exposed to flooding, although flooding of sites above the river floodplain is unlikely. The analysis determined that the two major streams in the area, Ramsdyke and Long, as well as other small tributary streams, have narrow or nonexistent floodplains (ADNR 1980).

The 1995 *Baseline Water Quality Data Inventory and Analysis for Denali National Park and Preserve* (NPS 1995h) analyzed surface water quality data for several major

stream systems in the national park, including the Chulitna and Yentna Rivers; the data was obtained from five of the Environmental Protection Agency's national databases. According to the report summary, surface waters within the national park generally appear to be of good quality, with indications of some impacts from human activities. Potential sources of contaminants are principally associated with mining claims; or glacial streams that drain high-altitude mountainous areas and carry high sediment loads.

In summer 1995, water samples were collected for 11 clear streams and 8 glacial streams on national park and state lands the south side (NPS 1995g). The samples were analyzed for pH, electrical conductivity, chloride, nitrate, nitrogen, sulfate, calcium, magnesium, sodium, potassium, ammonium, dissolved organic carbon, alkalinity, discharge levels, turbidity, and suspended sediment. Creeks sampled included Long Creek (in Denali State Park near the Tokositna River), Cripple Creek, Snowslide Creek, Costello Creek, Camp Creek, and Colorado Creek (four sites). The water chemistry of the streams sampled reflects natural or "background" conditions. Table 4 provides discharge, suspended sediment, and turbidity levels determined for these creeks during the 1995 survey.

The Division of Mining and Water Management in Alaska's Department of Natural Resources has also conducted discharge surveys on Lake Creek and Kroto Creek (ADNR 1995b); see table 5.

Subsurface Waters

Information on subsurface hydrology on the south side is extremely limited; however, according to the *Denali State Park Master Plan* (ADNR 1989), the sands, gravels, and other unconsolidated materials associated with the major drainages should produce adequate quantities of groundwater of suitable quality for major facilities. If available, additional water resource data would provide baseline

information and would allow for a more quantitative determination of impacts.

The Tokositna area was analyzed for subsurface water characteristics during a 1980 site investigation. Though no wells or boreholes were drilled, some general trends of potential yields were determined based on surficial geology. Investigators speculated that the Tokositna River valley probably contains large quantities of groundwater (ADNR 1980), as is also likely the case for the mouths of Ramsdyke and Long Creeks. The groundwater potential for the saddle

and bench areas was considered lower than for the river valley because the recharge area above the saddle and bench is smaller; however “the presence of surface water during the winter in Long and Canyon Creeks indicated at least a limited quantity of groundwater because there is little or no runoff from snowmelt or rain. The groundwater of the saddle area could be contained in a high or perched water table.”

**TABLE 4: STREAM DISCHARGE, SUSPENDED SEDIMENT, AND TURBIDITY LEVELS
1995 SAMPLING SURVEY**

Stream	Type	Date of Sample	Discharge (cfs)	Turbidity (NTU)	Suspended Sediment (mg/l)
Cripple Creek	Glacially Influenced	06/10/95	322.81	24.0	88.14
Cripple Creek	Glacially Influenced	07/15/95	113.72	4.7	3.61
Cripple Creek	Glacially Influenced	07/28/95	77.23	2.7	5.10
Cripple Creek	Glacially Influenced	08/19/95	50.81	10.2	11.01
Snowslide Creek	Glacially Influenced	06/10/95	299.91	30.0	109.66
Snowslide Creek	Glacially Influenced	07/15/95	208.85	47.0	60.88
Snowslide Creek	Glacially Influenced	07/28/95	148.34	67.0	92.43
Snowslide Creek	Glacially Influenced	08/19/95	120.58	84.0	128.87
Costello Creek	Clear	07/14/95	143.67	44.0	43.13
Costello Creek	Clear	09/11/95	104.93	55.0	66.99
Camp Creek	Clear	07/14/95	17.44	2.1	0.35
Camp Creek	Clear	09/11/95	22.27	5.9	9.61
Long Creek	Clear	08/20/95	3.99	0.3	1.10

Colorado Creek	Clear	07/14/95	34.63	9.1	10.00
Lower Colorado Creek	Clear	09/11/95	44.07	89.0	99.86
W. Fork Upper Colorado	Clear	09/11/95	32.22	15.1	18.01
E. Fork Upper Colorado	Clear	09/11/95	12.94	140.0	165.62*

* Elevated value reflects conditions during data collection (i.e., pouring rain and run-off)

TABLE 5: DISCHARGE LEVELS — 1989–1992 SAMPLING SURVEYS

Stream	Date of Survey	Discharge (cfs)
Kroto Creek	08/15/89	335.70
Kroto Creek	08/14/89	76.26
Kroto Creek	04/11/89	5.84
Lake Creek	03/28/89	53.50
Lake Creek	06/27/89	1968.60
Lake Creek	10/18/89	1151.50
Lake Creek	04/13/90	404.80
Lake Creek	06/21/90	1991.63
Lake Creek	08/02/90	839.20
Lake Creek	10/04/90	1225.80
Lake Creek	07/09/91	1331.00
Lake Creek	06/30/92	1500.00

BIOLOGICAL ENVIRONMENT

VEGETATION

Community Types

A land cover classification for the south side was completed by the planning team in 1992 to provide background information for the development concept plan and to help analyze proposals.

The classification comes from a nearly cloudless LANDSAT satellite image acquired on June 15, 1986. The image covers 6 million acres on the south side — half of which is outside the boundaries of the national park. The state park is shown in the image. The image ends at Cantwell. Resolution of the image (pixel size) is 30 meters.

The spectral reflectance data from this image was divided into four nonvegetated classes and eight vegetated classes. Water, barren, cloud, and snow/ice comprise the nonvegetated classes. The vegetated classes are listed below generally from lower to higher elevation.

Mixed Forest. This class is usually co-dominated by white spruce and balsam poplar. It is extensive in the broad valley of the lower Chulitna River but is nearly absent in the Broad Pass area. Its understory is often dense and includes many shrub species.

Deciduous Forest. This class is dominated by deciduous species, primarily balsam poplar and paper birch. It is less extensive than that of the mixed forest class and exists primarily on upland benches and lower valley slopes. Its understory is usually less dense than mixed forest because the more closed canopy allows less light onto the forest floor.

Sparse Lowland Vegetation. This cover class is rare and does not occur extensively on the south side. It is most likely to be found in areas of recent glacial or river disturbance. By

definition it exists below 2,000 feet elevation. Species composition is not known but is likely early successional sedges and forbs.

Wetland/Muskeg. Wetland types on the south side include riverine, palustrine, and lacustrine. Wetland sites are primarily muskeg and are extensive along the south side of the Alaska Range. Dominant species are sphagnum, cottongrass, and other emergents. Sites are often underlain by permafrost.

Tall Shrub. These are shrub-dominated stands that are more than 4 feet tall. A shrub height of about 4 feet, or about waist height, was chosen as the cutoff between tall shrub and low shrub. This determination was made because a hiker's ability to see a bear or moose would be impaired by shrubs taller than 4 feet. The tall shrub class is composed primarily of Sitka alder and the taller willow species. Often occurring in large contiguous stands, it is the most dense of all the cover classes and is extensive in the area.

Low Shrub. This class is composed primarily of shorter alpine/subalpine willows and dwarf birch. Shrub height is less than 4 feet. It is the most extensive vegetation class in the project area and exists primarily in upper subalpine valleys and near Broad Pass.

Grass. Grass often forms a relatively distinct elevational band below the tundra class and above the low shrub class, particularly in the Peters and Dutch hills.

Tundra. This class exists at the highest vegetated elevations and is usually dominated by heath-family dwarf shrubs, avens, sedges, or lichens.

Vegetation in Potential Development Sites

Tokositna Drainage and Proposed Petersville Road Corridor. Both mixed and deciduous forest classes occur along the Tokositna River and between the Tokositna River and the George Parks Highway. Tundra, grass, and tall shrub vegetation is found on the slopes of the Peters and Dutch Hills generally above 2,500 feet. Wetland/muskeg vegetation is found on the lower slopes of these hills (below 2,500 feet) above the Tokositna River(ADNR 1980).

Vegetation along the first 10 miles of the Petersville Road consists primarily of mixed forest; beyond 10 miles, vegetation becomes a mix of grass and low and tall shrub.

Wetlands occur in many locations, but are concentrated in the lowlands near the Tokositna River.

Chelatna Lake and Associated Creeks. The following vegetation classes are included in this area: tall shrub, low shrub, wetland, grass, and tundra. Both the tall shrub and low shrub classes are intermixed in the valley bottom of Cripple Creek and extend up the creek from Chelatna Lake for about 8 miles. A mixture of low and tall shrubs also occurs in the first 2 miles above the mouth of Coffee Creek. Grass and tundra classes occur on the Cripple Creek and Coffee Creek sidehills above 2,000 feet elevation and near their headwaters. The wetland class is confined to the lakeshore, the immediate head of Chelatna Lake, small isolated pockets in the valley bottom and along the sidehill north of Cripple Creek and in the Coffee Creek drainage.

Northern, Central, and Central Development Zones in Denali State Park. The northern state park development zone (elevation 1,600 feet) is in the mixed forest, deciduous forest, and tall shrub classes. There are relatively large areas of muskeg in this zone. The southern and central state park development zones (elevation 600 feet and 800 feet, respectively) are in mixed forest and deciduous forest classes. Wetlands are scattered throughout these zones.

Several additional studies have been conducted in and around the south side, including NPS

Dunkle Hills/Broad Pass. The vegetation in this area represents a transition from the characteristic south side classes. Tundra is much more prevalent and there are few if any grass and tall shrub species present. Most of the Denali Fault and the Dunkle Mine area is in the tundra class. Wetlands occur in scattered locations throughout this area.

WILDLIFE

General Overview

In general, density data on wildlife populations on the south side is limited. If density data were available for the entire south side area, such data could provide a more complete picture of wildlife activity in the area and could be used to make a more quantitative prediction of impacts on populations.

The description of wildlife presented below is based on the best available data on the south side, including ADFG survey and inventory reports; other federal, state, and private studies; and personal observations of NPS and state of Alaska employees, area hunting/fishing/backcountry (hiking)/rafting guides, and individuals living or recreating on the south side.

ADFG survey and inventory reports are annual updates on population densities and harvest numbers for various game animals found in ADFG management units. Reports generally discuss findings in terms of game management units (GMU) or game management subunits (GMSU). The GMSU directly relevant to the south side study area are 13E (7,218 square miles), 14B (2,151 square miles), 16A (1,850 square miles), and 16B (10,405 square miles). Detailed boundary descriptions of these game management subunits are included in appendix H.

aerial surveys and ground patrols, ADFG and ADNR studies supporting the *Susitna Basin*

Recreation Rivers Management Plan (1991) and the *Susitna Area Plan* (1985), and studies conducted by private-sector or university researchers. Where scientific data are lacking, a few personal observations by NPS and state of Alaska personnel, area hunting/fishing guides, and other members of the public who live and recreate on the south side have been used as supplemental anecdotal information. It should be noted that this anecdotal information may not represent the norm, as it simply reflects “chance encounters” and is not based on formal scientific studies.

The south side is home to a wide variety of wildlife and provides migratory corridors for many more. Small mammals include lynx, red foxes, beavers, wolverines, land otters, minks, short-tailed and least weasels, martens, snowshoe hares, red and flying squirrels, porcupines, muskrats, marmots, pikas, and coyotes (ADNR 1980). Lynx, which are considered a species of concern under the Endangered Species Act, are covered in detail in the “Threatened, Endangered, or Sensitive Species” section.

Larger mammals include Dall sheep, mountain goats, grizzly (brown) bears, black bears, caribou, moose, and wolves. More detailed information about the latter five species is provided in the sections below. General habitat maps are also provided in appendix I for moose, grizzly bear, black bear, and caribou.

Nonmigratory and migratory birds are also abundant on the south side. Nonmigratory birds include, to name a few: ravens, magpies, downy woodpeckers, chickadees, spruce grouse, brown creeper, gyrfalcon, pine grosbeak, redpoll, willow and rock ptarmigans, and several species of owls. Migratory birds include golden and bald eagles, the northern goshawk, the olive-sided flycatcher, and the American peregrine falcon. Golden eagles are considered uncommon summer residents in Denali State Park (ADNR 1989). Bald eagles are considered common summer residents in the state park (ADNR 1989) and several bald eagle nest sites have been identified throughout the south side,

including near Chelatna Lake, along the Kanikula and Tokositna Rivers, and in the vicinity of the Petersville Road (NPS 1995c; ADNR 1985). The northern goshawk, olive-sided flycatcher, and American peregrine falcon are either listed under the national Endangered Species Act or are considered species of concern; they are described in detail in the “Threatened, Endangered, or Sensitive Species” section.

Waterfowl are also numerous. For example, waterfowl density in the Tokositna River valley has been estimated to be about 12 breeding birds per square mile (ADNR 1980). Trumpeter swans, Harlequin ducks, and Tule greater white-fronted geese are three migratory waterfowl species that are of particular interest and are, therefore, described in greater detail below under the sections on trumpeter swans and threatened and endangered species, respectively.

Grizzly and Black Bears

Both grizzly and black bears inhabit the south side. Black bear range usually coincides with forested habitat, while grizzly bears prefer more open terrain (Herrero 1972); however, in interior mountain populations, grizzly bears are often found to intensively use each major plant community in an ecosystem at some time during the year (Martinka and Kendall 1985).

Grizzly Bears. Surveys on grizzly bear density have only been completed for sections of the south side study area as part of studies being conducted for larger areas.

Though no actual surveys were conducted, the Alaska Department of Fish and Game estimated bear density in the entire GMSU 14B, including those portions inside and outside the south side study area, to be 0.05 to 0.06 bears per square mile (ADFG 1990a).

Additionally, grizzly densities have been estimated from 1994 survey data for those portions of GMSUs 16A and 16B within the south side study area — excluding lakes,

glaciers, large rivers, and areas above 5,000 feet (ADFG 1993f; ADFG 1996b).

- GMSU 16A – 0.03 to 0.06 bears per square mile within the
- GMSU 16B – 0.06 to 0.10 bears per square mile within the 682 square miles of GMSU 16B in the study area.

Grizzly density has also been estimated for certain areas nearby, and similar to, the south side study area. A 1987 ADFG survey estimated a grizzly bear density of 0.07 bears per square mile in an area near the Susitna River in GMSU 13E, about 50 miles east of the eastern border of the south side study area.

Grizzly hunting occurs in the fall and spring throughout the south side, particularly in the Dutch and Peters Hills near the Tokositna area. Hunters access hunting areas on foot, via ATV, snowmachine, and automobile.

Game management subunit 13E has the highest brown bear kill density (reported kills/unit area) in interior Alaska with heavier harvests occurring in areas that are easy and inexpensive to access (ADFG 1993d; Miller 1990). Grizzly harvest in this subunit is thought to be exceeding a sustainable level and contributing to a population decline. Hunting pressure in GMU 13 as a whole is expected to further increase as a result of liberalized bear hunting regulations implemented by the Alaska Board of Game in response to a 1994 state law mandating the maximum production of ungulates (Miller 1995). Subunit 16A has the second highest kill density for areas having low density populations — less than 40 bears per 384 square miles (ADFG 1993d).

Grizzly bears are particularly well adapted to mountain habitats such as the foothills of the south side. They are also highly mobile in their search for food and are opportunistic feeders, with their habits and movements varying based on the food sources present at different times of the year. A large part of a bear's behavior is learned from its mother and, as it gets older,

1,162 square miles of GMSU 16A in the study area; and

from past experience. Therefore, grizzlies often establish a seasonal pattern of moving from one food source to another that is repeated each year.

Upon emerging from their dens in mid-spring, grizzly bears typically seek foods high in protein and fat. On the south side moose calves and winter-killed moose are likely the most important food sources of this class during this period. Moose wintering and calving takes place in the mixed forest or deciduous forest vegetation classes, which is where grizzly bears tend to forage during spring months.

As snow melts and south-facing slopes begin to “green up,” rhizomatous grasses, succulent forbs, roots, and tubers become more important food sources. On the south side green-up usually occurs in May and June, at which time grizzly bears become widely dispersed.

Beginning in late June, anadromous fish enter the smaller streams in the lowlands to spawn. Observations indicate that within one to two weeks after the first spawners die, the concentration of bears around the spawning streams starts to increase and generally peaks between late July and early August; salmon numbers and runs vary greatly year to year, so the exact time of peak bear concentrations is not predictable (Faerber 1995). These fish are probably the most important concentrated food source for grizzlies on the south side. Numerous observers have noted the larger size of the grizzlies on the south side compared with those north of the Alaska Range. The large caloric content of the spawning salmon on the south side is the most likely cause of this difference.

Bears have been known to hunt for salmon well outside their normal range, traveling to drainages that have a history of producing large quantities of, or preferred, species of salmon (ADFG 1995a; Faerber 1995). Horseshoe Creek

on the east side of the Chulitna River in Denali State Park seems to be a magnet for bears. Grizzly and black bears have been seen fishing this creek within 100 yards of each other during. During late summer and fall, blueberries and other berries ripen and provide another important food source.

Denning is generally initiated in late October or November and lasts until about April. On the south side grizzly bears usually den at the higher elevations of the foothills; however, denning is also known to occur in lower elevation timber (NPS 1995c; Faerber 1995). Typically grizzly excavate their own dens on moderately steep slopes that have well drained and deep soil. Although denning may occur on slopes facing any direction, slopes with a southern aspect appear to be preferred (Miller 1987). Usually a site is chosen that has sufficient snow deposition and wind patterns to seal the den entrance and cover it with an insulating layer of deep snow.

Information obtained from wildlife studies in or near the south side and from personal observations provide the additional details below on grizzly bear density and habitat in potential development sites.

Tokositna Drainage and Proposed Petersville Road Corridor — Grizzly density for the Tokositna and the Petersville Road areas has been estimated roughly as low to medium (ADFG 1996b). Grizzly bear are often observed in the Tokositna area (NPS 1995c; Okonek 1995). In July 1994, four grizzlies (two sows, each with a cub) were observed on the northeast side of the Tokoshas (NPS 1995c). In the spring and summer of 1992, NPS rangers on patrol in July sighted a sow and two cubs at the toe of the Tokositna Glacier (NPS 1995c).

Moose are known to winter and calve in the mixed and deciduous forest along the Tokositna River (see section on moose). Therefore, it is likely that this area is important to grizzly bears in the spring and early summer when winter-killed moose and moose calves can be found. Evidence of moose killed by grizzly have been

the spawning season (Faerber 1995). Other streams in the area also receive a high level of bear use at this time of year.

found near the toe of the Tokositna Glacier and the Ruth Glacier every year for the last decade and at the toe of the Kanikula Glacier in 1994 and 1995 (NPS 1995c).

From mid-July through September several salmon species ascend clear water streams near the confluence of the Tokositna River and Alder Creek. The fish spawn and die in these streams and provide an excellent food source for bears and other scavengers. From direct sightings and the presence of tracks and scats, grizzlies are known to concentrate along these streams during this period (Okonek 1995; NPS 1995c). Also during this time, ripened berries attract bears to the area.

Grizzly denning occurs throughout the Tokositna area (ADNR 1980; NPS 1995b, 1995c; Okonek 1995).

Chelatna Lake and Associated Creeks — Grizzly density for the Chelatna Lake area has been estimated roughly as low to medium (ADFG 1996b). Sockeye (red) salmon spawn in Chelatna Lake, as well as Cripple Creek and Coffee Creek (ADFG 1984a). The lower 2 miles of Cripple Creek below the falls are heavily used by salmon (Okonek 1995). The presence of these fish likely attract bears to this area.

It is also likely that the tundra and grass vegetation classes of the higher elevations and upper Cripple Creek and Coffee Creek receive dispersed grizzly bear use in late July and August when berries ripen.

Northern, Southern, and Central Development Zones of Denali State Park — Grizzly density for the northern development zone has been estimated roughly as low (ADFG 1996b). Grizzly have been sighted in the northern development zone by park rangers in the spring (ADNR 1995). In an on-site survey by the Alaska Department of Fish and Game in this area, tracks were identified along the Chulitna River near its confluence with Pass Creek and

Granite Creek (ADFG 1989a). The bears appeared to be feeding on sockeye salmon which were observed spawning in those areas (ADFG 1989a). Grizzly habitat has also been identified. The southern development zone provides general grizzly habitat, including a source of late season berries (ADNR 1989). Grizzly density for the southern development zone has been estimated roughly as low (ADFG 1996). No denning occurs right in the zone; however, the area along the Susitna River from Curry Railroad station north to the Denali Highway is a popular denning area for grizzly bear, starting near the second week of October (Miller 1989).

Grizzly have also been seen in the central development zone during the summer (ADNR 1995) and the slopes just east of Byers Lake have been identified as a berry source for bears in the late summer (ADNR 1989). Grizzly density for the central development zone has been estimated roughly as low to medium (ADFG 1996b).

Dunkle Hills/Broad Pass — Grizzly density for the Dunkle Mine area has been estimated roughly as low to medium (ADFG 1996). Important brown bear concentrations are found just east of the George Parks Highway between Honolulu and Hardage Creek (ADNR 1985). NPS rangers have seen a number of brown bear during summer and fall hunting patrols. A patrol in September 1992 noted at least eight different brown bears while traveling from the West Fork of the Chulitna (below the Golden Zone Mine), through the Dunkle Mine area, and along Bull River, a distance of only 10 miles. This density is much greater than the estimate of 0.07 bears per square mile for the area near the Susitna River in GMSU 13E, and was attributed to salmon spawning in the streams.

Grizzly bears are common in both the Denali Fault and Riley Creek areas. Based on vegetation type, it is possible that densities here are at least as high as those in the interior of the park on the north side. North side density is reported as being between about 0.07 bears to 0.1 bears per square mile (Dean 1976).

identified east and southeast of this development zone (ADNR 1989).

Black Bears. As with grizzly bears, little is known about the density of black bears on the south side. However, black bear density along the Susitna River in an area that includes a portion of GMSU 13E was estimated to reach about 0.2 bears per square mile (Miller et al. 1987). This area is about 50 miles east of the eastern boundary of the south side study area. Overall concentrations of black bears on the south side is thought to be decreasing (ADFG 1995).

Black bears are hunted throughout the south side and there is no closed season for hunting.

In contrast to grizzly bears, black bears prefer forest communities below 2,000 feet elevation (ADFG 1978a), although, as noted earlier, in the south side study area their ranges often overlap with that of the grizzly. They are known to be present in fairly large numbers in the lowland forests of the Chulitna, Ruth, and Tokositna Rivers; however, their home ranges often extend out of these forests well up into the open tundra vegetation classes of the higher foothills (NPS 1995c). They are present from the lower end of the Ruth Glacier down to the Tokositna River and in the Chelatna Lake area.

Like grizzly bears, black bears are opportunistic feeders and sometimes frequent the same habitats at the same time as grizzly bears. They are known to feed on the same berry crops as grizzlies on the side hill between Alder Point and the Ruth Glacier and in the same salmon-spawning areas near the Tokositna River and other creeks (re: Horseshoe Creek during spawning season as described under grizzly bears). Devil's club can also be an important source of food for black bears; Schwartz and Franzman (1991) documented significant reliance on devil's club by black bears on the Kenai Peninsula (ADFG 1996).

Unlike grizzly bears, black bears den almost exclusively in forested areas. Den sites are

typically excavated in the ground but also may be natural earth cavities or hollow trees.

Information obtained from wildlife studies in or near the south side and from personal *Tokositna Drainage and Proposed Petersville Road Corridor* — Black bears inhabit the Tokositna area along with grizzlies. Black bear density for the Tokositna Glacier has been estimated roughly as low to medium (ADFG 1996). For the Petersville Road, a rough estimate of black bear density is low to high. Such a situation does not often occur unless food is abundant; therefore, this area appears to provide good bear habitat (ADNR 1980). A large population of black bear has been observed in the high alpine vegetation of the Tokoshas and, on a late summer patrol in 1995, a black bear and three cubs were seen between the Tokositna Glacier and Quill Hill (NPS 1995c).

From mid-July through September, black bears compete with grizzly for salmon ascending the numerous clear water streams near the confluence of the Tokositna River and Alder Creek.

Black bear denning occurs in the Tokoshas, as well as in other locations in the area.

Chelatna Lake and Associated Creeks — Individual observations and encounters with black bears and black bear signs in this area indicate that it is another area where black bear and grizzly overlap ranges (Okonek 1995). Black bear density for the Chelatna Lake area has been estimated roughly as low (ADFG 1996). A 1992 NPS patrol located two black bear on Coffee Creek, and black bear have also been encountered at the head of Cripple Creek, high in the alpine zone (NPS 1995c).

Like grizzly, the black bear takes advantage of the salmon spawning and berry seasons for food.

Northern, Southern, and Central Development Zones of Denali State Park — Black bear density for the northern development zone has

observations provide the additional details below on black bear density and habitat in potential development sites.

been estimated roughly as medium (ADFG 1996). In an onsite survey in the northern development zone of Denali State Park no black bear were observed, but numerous scat were noted near High Lake and Summit Lake (ADFG 1989a). Black bear denning has been identified in areas south and northeast of the development zone (ADNR 1989).

The southern development zone provides general black bear habitat, including a source of late season berries (ADNR 1989). Black bear density for the southern development zone has been estimated roughly as medium (ADFG 1996). No denning occurs right in the zone; however, an area just northeast of the zone has black bear denning (ADNR 1989). Additionally, the area along the Susitna River from Curry Railroad station north to the Denali Highway is a popular denning area for black bear as well as grizzly (Miller 1989).

Although the 1989 *Denali State Park Master Plan* did not identify the central development zone as black bear habitat, park rangers have consistently seen black bear in this area (ADNR 1995) and the slopes just east of Byers Lake are a known berry source for bears in the late summer (ADNR 1989). Black bear density for the central development zone has been estimated roughly as medium to high (ADFG 1996b).

Dunkle Hills/Broad Pass — Black bear density for the Dunkle Mine area has been estimated roughly as low (ADFG 1996). Large spring concentrations of black bears inhabit an area near Fourth of July Creek in Broad Pass, somewhat paralleling the George Parks Highway (ADNR 1985). Several black bear were observed, along with the eight grizzly mentioned earlier, during the 1992 fall patrol from the West Fork of the Chulitna to Bull River (NPS 1995c). Black bear are seen on most summer and fall hunting patrols in the area.

Caribou

Caribou use is limited mostly to the northeast part of the planning area where use is primarily by the Denali herd and, to a lesser extent, the Nelchina herd. The Denali herd numbered from 20,000 to 30,000 animals from 1900 to the early 1940s, but declined to around 1,000 by 1975. By 1987 the herd had increased to an estimated 2,700 (NPS 1989b). The current population is about 2,300 to 2,400. The Nelchina herd contained 5,000 to 15,000 caribou in the late 1940s, but has fluctuated dramatically since that time; the herd is now estimated to number about 45,500 (ADFG 1993a).

Caribou are a popular game animal and are generally hunted on the south side in the late summer and early fall, though in some areas, the hunting season extends through the early spring (March).

The preferred habitat of caribou in the Susitna River Basin (an area that covers most of the south side) includes the following: open or closed coniferous forests; upland low shrubs (willow, resin birch); riparian low shrubs; herbaceous freshwater wetlands (sedge, grass); alpine grasslands; shrub tundra; and other tundra (herbaceous, mat and cushion, sedge-grass) (USDA 1985).

Specific caribou use of the potential development sites on the south side is discussed below.

Tokositna Drainage and Proposed Petersville Road Corridor — Caribou have been known to use this area, including the Peters and Dutch Hills and the Tokosha Mountains, but use is very rare (ADNR 1980; ADFG 1996).

Chelatna Lake and Associated Creeks — Use of this area by caribou is very rare.

Northern, Southern, and Central Development Zones of Denali State Park — No caribou were observed in an on-site survey of the northern development zone (ADFG 1989a). However three adult caribou were seen about 15 miles

north of the state park boundary in the Talkeetna Mountains; therefore, it is possible that a few caribou make use of the area (1989a). Additionally, occasional forays by caribou from the Nelchina herd to the Susitna River near Gold Creek (along the northeastern edge of the state park) have been documented (ADFG 1995a).

Dunkle Hills/Broad Pass — The following discussion is based on National Park Service research reports (NPS 1982 and 1986a), unless otherwise noted. Caribou use of the Broad Pass area was first reported in 1898. All caribou herds have a strong tendency to return annually to traditional calving areas (ADFG 1973). The Denali herd uses three calving grounds — Cantwell on the south side and Wonder Lake and Stampede on the north side of the range. This herd spends most of the year on the north side of the Alaska Range; however, 10–90% of the herd crosses to the Cantwell calving grounds each year for calving or immediately after calving.

Although in the past, the Cantwell grounds may have been the most significant in terms of the percentage of the herd that uses them and calf survival (NPS 1982; Kline et al.; Kline and Boertje 1984), recent studies indicate the Cantwell grounds have been used less extensively for calving by the Denali herd than the two northern areas (NPS 1989b).

Most caribou move to the south side from the Sanctuary River over a pass to the upper West Fork of Windy Creek. It was estimated that about 90% of the caribou migrating to the south side used this pass in the late 1970s. From Windy Creek they move through Foggy Pass to Cantwell Creek and beyond to the Bull River. Crossing of the range also occurs between the Sanctuary River and Windy Creek itself, from the East Fork of the Toklat to the Bull River, and over Anderson Pass. Historical movements occurred in the 1920s and 1930s from Riley Creek to the main fork of Windy Creek. Recent field observations indicate that caribou

movement occurs over nearly all negotiable passes between the Toklat and Sanctuary. Caribou use in the Cantwell calving grounds is primarily post-calving; however, significant calving has also been documented (NPS 1982; Kline et al. 1983; Kline and Boertje 1984). The area of heavy use is bounded on the west by the West Fork of the Chulitna River, on the east by Windy Creek, on the north by the 4,000- or 5,000-foot contour, and on the south by the park boundary; however, caribou are present on slopes up to 6,000 or 7,000 feet in mid-July. Calving grounds studies conducted in 1976, 1981, and 1982 indicated that groups of 100 to 250 caribou were repeatedly observed north of Camp Creek, on Costello Creek, and near the braided channels of the upper Bull River. The highest documented densities of caribou have been in the areas north and west of the Dunkle Mine site, including lower Colorado Creek, Costello Creek, Camp Creek, and the Bull River. Easy Pass, Foggy Pass, and the Cantwell Creek areas are also used. The Dunkle Mine site itself was also considered to be in the area of highest caribou concentration. Caribou groups were observed in virtually all of the drainage and side drainages of the fault area from their headwaters to the national park boundary. In some years use has occurred outside the park boundary as well. Caribou might have used the Cantwell area differently when the herd was larger. In the late 1960s, when the herd numbered around 8,000, calving occurred southeast of the Dunkle Hills all the way to Broad Pass.

Caribou generally begin using the lower tundra portions of the calving grounds in May and June and move to higher elevations in June and July (NPS 1982). Calving takes place on snowfree tundra as high as possible given snow conditions for the year. During calving season, caribou use an artificial mineral lick on the exposed overburden of the old Dunkle Mine site. Almost daily use of this lick was observed from mid-May to early June, 1979. Caribou would visit in groups of up to 400 animals, and smaller groups would move several miles to use the site.

Rivers.

In the late summer, caribou gradually move back to the north side of the park. Fairly extensive daily movements have been documented. In some years part of the herd (up to one-third) have remained on the south side until fall.

The Broad Pass has also historically been used as winter range by the Denali herd, however, recent trends (up to 1985) suggest that only a "handful" of the Denali herd winters in the Cantwell/Broad Pass area (Singer 1987).

In the early 1960s thousands of caribou from the Nelchina herd to the east used the corner of the national park near Cantwell as winter range, including the Windy Creek and Riley Creek drainages (ADFG 1985b; NPS 1982, 1986a). Numbers decreased in the 1970s, but recent data indicate that, since the 1980s, use of the Cantwell area as wintering grounds by the Nelchina herd has been increasing (ADFG 1994a). Summer and fall use by the Nelchina herd of the area east of the George Parks Highway extending from Cantwell south to the Chulitna Hills has steadily increased, as well (ADFG 1994a).

Moose

Moose inhabit the entire vegetated planning area except the highest tundra communities. Density estimates for moose have been calculated for several areas on the south side at different times of the year.

Moose density in the 569.1 square miles of GMSU 13E that are within Denali State Park (Curry Ridge and Upper Troublesome) was calculated from fall 1994 survey data; density was estimated to be 1.1 to 1.4 moose per square mile. This estimate shows a 20%–40% decline from 1990 composition counts for post-rut/early winter moose concentrations in the area (ADFG 1996b).

Post-rut/early winter moose densities have also been estimated from 1994 survey data for those portions of GMSUs 14B, 16A, and 16B within the south side study area — excluding glaciers, lakes, and elevations above 3,500 feet (ADFG 1996). These densities are as follows:

GMSU 14B – 0.9 moose per square mile in the 64.5 square miles of

GMSU 16B – .5 moose per square mile in the 269.7 square miles of GMSU 16B which are in the study area.

An aerial moose survey of a 903-square-mile area in and around Denali State Park was done in late March 1990 and yielded a population estimate of 1,070 moose, for an average of 1.2 moose per square mile. It was believed the moose populations in this area would have been significantly higher in the fall, based on known moose movements (ADFG 1990b).

Moose are hunted throughout the south side during the late summer and fall, and in some areas the hunting season remains open through part of winter (December and January). Hunting pressure on moose has increased in GMSU 16A in part due to expansion of the local road and trail system in the area due to mining, forestry, and recreational activities, but remains focused along the roads and larger stream areas (ADFG 1989b). Fall hunting pressure in subunit 16B has declined recently in response to elimination of cow season and the cost of accessing roadless areas (ADFG 1989b).

Moose in the Susitna River Basin prefer the following habitat: young forests, especially deciduous and mixed; low and tall shrublands with willow, birch, aspen, poplar, cottonwood, alder, lowbush cranberry, and other woody browse; freshwater wetlands, including muskegs, bogs, and marshes; forested and shrubby stream and river valleys; shrub tundra, and other tundra (herbaceous, mat and cushion, sedge-grass) (USDA 1985).

GMSU 14B which are in the study area;

2.3 moose per square mile in the remaining 26.4 square miles of GMSU 14B which are in the study area;

GMSU 16A – 1.6 moose per square mile in the 946 square miles of GMSU 16A which are in the study area;

Moose concentrations vary seasonally and correlate with snow depth and timing (ADFG 1992b). Most calving takes place from late May through June. During calving, cows tend to seek areas within their home range that provide low predator densities (islands in rivers) or improved visibility (open muskeg areas) (ADFG 1996). Post-calving moose generally move to higher elevations. Fall rutting and post-rutting concentrations occur in subalpine habitats, with moose moving down from these areas in winter as snow depths increase (ADFG 1992a). Riparian willow stands provide a large part of winter forage and upland coniferous forests provide thermal cover and shallower snow depths (ADNR 1991).

Important moose concentrations within the south side study area include the Sunflower basin (next to Chelatna Lake), the Kahiltna Flats, the Petersville Road, Moose Creek, Bear Creek, Peters Creek, Little Peters Hills, Peters and Dutch Hills, the Tokositna River valley sides and bottom, the south end of Curry Ridge, upper Troublesome Creek, and Twenty Mile Creek (ADFG 1984a; ADFG 1995a).

Moose use of the potential development sites on the south side is discussed below.

Tokositna Drainage and Proposed Petersville Road Corridor — Moose are year-round residents in the Tokositna area (ADNR 1980). The lower Tokositna River valley is identified as summer range in the *Denali State Park Master Plan* (ADNR 1989). A large area of rutting concentration is found in the Peters and Dutch Hills (ADFG 1985a).

The upper Tokositna River valley is identified by the state as winter range (ADNR 1989). Rangers also report high numbers of moose in this area in the winter. This is especially the case on the south side of the Tokoshas where a flyover counted 88 moose in a two to three square mile area (this area is known as “Moose Meadows” to pilots who lead scenic flights out of Talkeetna) (NPS 1995c).

The Susitna Basin Recreation Rivers Management Plan adopted in 1991 identified the most heavily used winter ranges in this area as the Peters Creek corridor near the Little Peters Hills, the Moose Creek corridor south of the Petersville Road, sites near the community of Trapper Creek, and the floodplains of the Susitna and Chulitna Rivers (Modaferri 1988). A proportion of this population was thought to winter on the western slopes of the Little Peters Hills or on the Kahiltna Glacier forelands, and a small number was thought to cross the Chulitna and Susitna River floodplains to use sites near the George Parks Highway, the Alaska Railroad rights-of-way, and near the community of Talkeetna (Modaferri 1988).

Two years later, in late March 1990, another aerial survey of the Tokositna drainage and areas just north of the Petersville Road found a moose density ranging from zero (near Cottonwood Creek) to low (Petersville area, Bunco Creek, Twentymile Creek, Moose Creek, Kroto Creek, lower Tokositna River) to medium (Tokositna River flats, Ramsdyke Creek, and Cache Creek) to high (Upper Tokositna River, Home Lake, and Long Creek) (ADFG 1990b). Mean density of moose was 0.7, 1.2, and 3.2 moose per square mile for low, medium and high categories, respectively (ADFG 1990b).

Chelatna Lake and Associated Creeks — Winter moose density in the area around Chelatna Lake is considered to be roughly low to medium (ADFG 1996). As noted above, important moose concentrations are found in the Sunflower basin, next to Chelatna Lake. Moose also use the area around Chelatna Lake itself, especially during the summer.

High numbers of moose also winter in the Little Peters Hills/Petersville area where the riparian zones of Moose, Kroto and Peters Creeks provide critical habitat for winter survival (ADNR 1991). According to a study done for the Susitna hydroelectric project, about 500 moose use this area, though winter conditions can cause this number to fluctuate as much as 60–70%, and large parts of the interior of this area are essentially devoid of moose in the winter (Modaferri 1988).

Northern, Southern, and Central Development Zones of Denali State Park — Portions of the northern development zone are identified as summer moose range (ADNR 1989). Although, the Alaska Department of Fish and Game atlas (ADFG 1985a) identifies the north development zone in the state park as a moose rutting and wintering area, an onsite survey in 1989 found no evidence of rutting or wintering activities in this area (ADFG 1989). A second aerial survey in late March 1990, however, found a density of 0.7 moose per square mile (low density) in the northern development zone (ADFG 1990b).

In the state park the south development zone is simply general moose habitat (ADFG 1985a), although winter use occurs along the bars of the Chulitna River (ADNR 1989). The 1990 survey categorized the southern development zone as having a mean of 0.7 to 1.2 moose per square mile (low and medium density categories, respectively), while the central development zone was found to have a mean of 0.7 moose per square mile (low density) (ADFG 1990b).

The central development zone provides summer moose habitat (ADNR 1989). Winter moose density in this zone is considered to be roughly low to medium (ADFG 1996).

Dunkle Hills/Broad Pass — A known moose herd ranges near Fourth of July Creek in Broad Pass and a large rutting concentration roughly coincides with caribou calving grounds in the higher country north of Broad Pass between Windy Creek and the Bull River (ADNR 1985; ADFG 1985a).

The drainages in the area of the old Dunkle Mine — the upper Bull River, Costello and Cantwell creeks, and the West Fork of the Chulitna — are identified as prime early-winter moose range (NPS 1984a; ADNR 1985). An early December survey conducted in 1993 of the Windy Creek, Cantwell Creek, Bull River and West Fork of the Chulitna River drainages from their headwaters east to the George Parks Highway found an estimate 213-133 moose, or **Wolves**

Within the study area boundaries, wolves are found year-round in a variety of habitats common to the area. Valleys, foothills and well-drained lowlands support forests of white spruce, birch, aspen and cottonwood. Wet lowlands are forested with black spruce and contain numerous lakes, ponds, and muskegs. Shrub lands and alpine tundra are found above timberline. These habitats support significant populations of moose, with lesser numbers of caribou and sheep, plus other species such as hares, beaver, and small mammals. These prey species support a population of wolves that appears to be increasing (ADFG 1993e).

Winter observations made since 1992 indicate that there appear to be a minimum of four wolf packs, and possibly five, that have some portion of their range within the study area boundary.

The Tokositna River pack, ranging from five to 12 animals, has been observed along the Tokositna River, Byers Creek, and Home Lake area. The Kahiltna River pack has been observed along the Kahiltna River, Little Peters Hills, Chelatna Lake and upper Lake Creek, with a pack size ranging from 3 to 12. The East Yentna pack of nine animals has been observed from the Yentna River to Home Creek. The Upper Chulitna River pack has been observed along the upper Chulitna River and along the East Fork of the Chulitna River, with a pack size ranging from one to three. Additional sightings, possibly indicating another wolf pack, have occurred along the Susitna River near the George Parks Highway with as many as 15 animals observed (ADFG 1996). A total of 33 to 51 wolves are estimated to be present in the

about 1.0 moose per square mile (NPS 1993). A 1992 survey in November of the same area estimated 304 to 330 moose in the area, representing an average density of 1.3 moose per square mile (NPS 1992a). Although moose are known to use mineral licks in Denali (NPS 1984b), it is not known if they visit the Dunkle Mine lick site. Winter moose density in the Dunkle Mine area is considered generally to be low (ADFG 1996).

The average size of wolf packs on the Kenai Peninsula during a 1976 to 1982 study (Petersen et al. 1984) ranged from 5.7 to 15.3 animals.

It is probable that one or more of these packs dens within the study area boundary. Petersen et al. (1984) determined that average territory size for wolf packs on the Kenai Peninsula was about 246 square miles, with a range of about 68 to 600 square miles. Territory size for wolf packs during a study in GMU 13 was more than twice this, averaging 634 square miles, and ranging from 364 to 980 square miles (Ballard et al. 1987).

During the 1992–93 trapping season, the most recent information available, a total of four wolves were reported taken from GMSU 16A (ADFG 1993e). This unit includes most of the study area. a similar harvest report is not available for that portion of the study area in GMSU 13E.

Trumpeter Swans

Trumpeter swans summer in forested wetlands on the south side, but migrate south during the winter. The species was listed as threatened under the Endangered Species Act in 1966, but was delisted in 1968 as a result of a census which found 2,847 swans in Alaska (USFWS 1993). Since 1975, trumpeter swan surveys have been conducted every five years to ensure their population does not decline to the point that relisting is required. In 1990, a total of 9,742 adult swans were counted in Alaska (USFWS 1993) — a 400% increase over the number of adults counted in 1968.

Trumpeter swans prefer riparian forests, and in or by lakes, ponds, or sloughs, for nesting and feeding, and herbaceous freshwater wetlands (sedge, grass) for feeding (USDA 1985).

Tokositna Drainage and Proposed Petersville Road Corridor — The Tokositna River is considered general habitat and Swan Lake, which drains into the Tokositna River, is identified as prime swan nesting habitat (ADNR 1985; ADFG 1985e; ADNR 1989). The most recent swan census (USFWS 1993) noted several swan sightings in the Tokositna area. Additionally, numerous surveys have found active trumpeter swan nests as well as large numbers of swans in the Tokositna River valley (ADFG 1979; USFWS 1979b, 1980). As shown below, the number of adult swans generally increased from one census to the next through 1985; however, the 1990 and 1995 censuses show a decline in numbers. The number of young-of-the-year swans recorded has remained relatively stable with the exception of 1985 and 1995 when no young swans were sighted.

Census Year	Total Adults	Total Young
1968	11	6
1975	23	6
1980	23	6
1985	40	0
1990	23	7
1995	12	0

Chelatna Lake and Associated Creeks — The Alaska Department of Fish and Game identifies Chelatna Lake as general habitat, with known nesting and brood-rearing concentration areas and known molting concentration areas just southeast of Chelatna Lake near Camp, Sunflower, and Home Creeks (ADFG 1985e). The 1990 swan census also noted several swan sightings to the southeast of the lake. This information is also found in other reports on the area (ADNR 1985, 1991).

Northern, Southern, and Central Development Zones of Denali State Park — The Alaska Department of Fish and Game has identified spring and fall swan concentration areas near

Specific trumpeter swan use of the potential development sites on the south side is discussed below.

Summit Lake in the northern development zone (ADFG 1985e).

The master plan for the state park identifies some swan habitat along the western edges of the southern development zone in the Chulitna River corridor. The master plan also recognizes the central development zone as swan habitat (ADNR 1989), and at least one nest has been identified within this area (ADNR 1995).

Dunkle Hills/Broad Pass — According to the 1990 trumpeter swan census, there have been numerous sightings of swans along the Chulitna River in Broad Pass. The Alaska Department of Fish and Game also refers to the Chulitna River as general habitat for the swans (ADFG 1985e).

FISH

Five species of Pacific salmon and eight other important freshwater game fish are found in Susitna Basin rivers, and, hence, the south side. Table 6 presents these species and notes many (though not all) of the south side creeks, rivers, and lakes that provide habitat for them (ADFG 1984a, 1995b; ADNR 1989, 1980, 1995b, 1995c). Additionally, four species of nongame fish are found in these rivers: blackfish, longnose sucker, slimy sculpin, and Arctic lampreys (ADFG 1984a; Morrow 1980; ADNR 1995c).

As stated in the *Fish and Wildlife Resources Element for the Susitna Area Planning Study*, “Freshwater systems to which salmon return and in which resident fish live are critical to the maintenance of their populations. Salmon and other species utilize freshwater habitat for migration, spawning, and rearing of young” (ADFG 1984a). Spawning seasons vary depending on fish species. The following spawning seasons are taken from the 1984 report cited above unless otherwise noted. Coho

AFFECTED ENVIRONMENT

salmon generally begin spawning from midsummer to early winter at the head of rifle areas in narrow side channels and tributaries of mainstream rivers. Pink salmon usually enter their natal streams from late June to September. Sockeye salmon spawn during the summer and fall from July to October, sometimes as late as December, with the majority of spawning occurring in streams connected to lakes and along lake shorelines. Spawning season for king salmon takes place from July to early September. The greatest spawning activity for chum salmon takes place in August and September. Arctic grayling spawn from mid-May to June. Dolly Varden spawn between the end of July and the beginning of December, with the greatest activity in September and October. The rainbow trout, whether stream or lake dwelling, spawn in the spring, with most breeding occurring from mid-April to late June. Spawning season for the

TABLE 6: GAME FISH SPECIES AND ASSOCIATED CREEKS, RIVERS, AND LAKES

Location	KS	CO	SS	CH	PS	LT	RT	GR	BU	DV	NP	WH	BC
Alder Creek													
Kroto Creek	X*		X										
Moose Creek	X*	X*	X*										
Peters Creek	X*	X*		X	X		X	X					
Tokositna River	X	X	X					X		X	X**	X	
Snowslide Creek	X*						X						
Easter Creek	X*						X						
Cripple Creek			X*										
Coffee Creek			X*										
Chelatna Lake	X*	X*	X*										
Chulitna River	X*	X	X	X	X		X	X	X	X		X	
Pass Creek	X						X			X			
Byers Creek	X*	X	X*	X*	X*		X*	X		X		X	
Byers Lake	X		X*			X	X	X	X			X	
Troublesome Creek	X*	X*	X*	X*	X*		X*	X	X	X			
Montana Creek	X*	X*		X*	X*		X*						
Talkeetna River	X	X	X	X*	X		X	X	X	X			X
Cache Creek	X*	X		X	X*		X	X					
Bunco Creek	X*	X	X**	X			X**	X	X		X		
Lake Creek	X*		X*	X*	X*		X	X	X				
Twentymile Creek	X*												
Honolulu Creek	X*	X	X*				X*	X*		X			
Sunflower Creek	X*	X*	X*				X	X					
Nancy Lake			X*										
Trapper Creek	X*	X*		X	X		X	X	X				
Home Creek	X*		X*										
Susitna River	X	X	X	X*	X		X	X	X				

KS = King Salmon
 PS = Pink Salmon
 BU = Burbot
 BC = Bering Cisco

CO = Coho Salmon
 LT = Lake Trout
 DV = Dolly Varden

SS = Sockeye Salmon
 RT = Rainbow Trout
 NP = Northern Pike

CH = Chum Salmon
 GR = Arctic Grayling
 WH = Whitefish

* = spawning habitat

AFFECTED ENVIRONMENT

** = unconfirmed report

remaining fish species is generally as follows: Burbot during the months of December through February; northern pike in early spring (coinciding with spring break-up in the northern latitudes); lake trout in September and October; and whitefish and ciscoes in late September and October (ADNR 1995c).

Peters Creek and its major tributaries are rated the seventh most important waterway in the Susitna Basin by the Alaska Department of Fish and Game (ADNR 1985). Chelatna Lake contains important salmon spawning habitat. (ADNR 1991). The Susitna River and its tributaries support the largest stock of king salmon in the Cook Inlet drainage which is believed to be the fourth largest stock in Alaska. The Susitna River also supports the largest coho salmon stock within the North Cook Inlet area. (ADFG 1994b).

Fishing is generally permitted throughout the south side; however, the Tokositna River drainage and Byers Creek are closed to king salmon fishing.

THREATENED, ENDANGERED, OR SENSITIVE SPECIES

The U.S. Fish and Wildlife Service reports that the American peregrine falcon (*Falco peregrinus anatum*) is the only federally listed endangered species that occurs in the study area. There are no other threatened or endangered plant or animal species occurring in the planning area (see appendix J); however, one mammal species of concern, two bird species of concern, and two candidate plant species of concern do or may exist in the area. The Alaska Natural Heritage Program has identified four additional plant species, which are ranked as sensitive by The Nature Conservancy for the state of Alaska, and which may be found in the south side study area (University of Alaska 1996). One "at risk" and one delisted bird species occur in the study area.

The North American lynx (*Felis lynx canadensis*) is a species of concern under the

As noted in the following discussion, with the exception of the Tule greater white-fronted goose, no specific surveys have been conducted for these species in the south side study area. Without such surveys, the status of these species on the south side and the potential impacts of the proposed action and other alternatives cannot be precisely determined. Surveys would be conducted as part of subsequent environmental analysis to determine for certain whether these species inhabit the study area. In addition, consultation with the U.S. Fish and Wildlife Service regarding such species would continue and measures developed as part of this consultation to ensure that any of these species found to occur in the study area would not be affected by the alternative actions.

Wildlife

The American peregrine falcon (*Falco peregrinus anatum*) is currently listed as an endangered species under the Endangered Species Act, but a proposed rule to remove the species from the list was published in June 1995 (*Federal Register* No. 34406) and is awaiting a final decision (see appendix J). Peregrines are also a state species of special concern for Alaska. These birds nest throughout the forested interior, mainly on cliffs along rivers or near lakes, and feeds primarily on other birds. Though no surveys have been conducted, existing data indicates there are no known nest sites in the study area. Foraging and transient birds may occur in the area; in Denali State Park, peregrines are considered rare (ADNR 1989).

The migrant Arctic peregrine falcon (*Falco peregrinus tundrius*) may also occur in the south side study area. This species was delisted in October 1994, but the U.S. Fish and Wildlife Service is required to monitor these species for five years following delisting.

Endangered Species Act (formerly called a candidate category 2 species), which means

there is some evidence of its vulnerability but not enough data to support a listing proposal at this time. Lynx inhabit most of Alaska, except for coastal regions. In the Susitna Basin, lynx have a limited distribution and are primarily residents of the northern boreal forest where they feed primarily on snowshoe hares. Occasionally, lynx occur on the tundra beyond treeline, particularly in years of severe food shortages when they may venture onto tundra in search of hares, lemmings, and ptarmigan (ADNR 1985). Little is known about lynx on the south side, though lynx sign has been found in the southern development zone of Denali State Park (ADNR 1995). In general, the potential for high lynx densities on the south side is thought to be low due to low hare densities during cyclic peaks (ADFG 1995a). The northern goshawk (*Accipiter gentilis*) is also a species of concern; the state also considers goshawks to be species of special concern. The goshawk is a large accipitrine raptor that feeds on grouse, ptarmigan, hares, and rodents (Gabrielson and Lincoln 1959). It nests in mature forests with an open understory, allowing flight beneath the canopy. No surveys have been conducted, but much of the south side is considered prime habitat for goshawks, so the numbers of these birds may be high (NPS 1995; USFWS 1995a). However, in the state park goshawks are thought to be uncommon, permanent residents (ADNR 1989).

A second bird species of concern is the olive-sided flycatcher (*Contopus borealis*); this bird is also a state species of special concern. Olive-sided flycatchers prefer coniferous forests where, in Alaska, they are partial to nesting in spruce trees (Gabrielson and Lincoln 1959). They feed primarily on bees, ants, flies, beetles, moths, and caterpillars. These birds are an uncommon summer visitor to the state park (ADNR 1989) and also probably use other areas on the south side. These birds are known to nest in Denali State Park (ADNR 1995).

Four other plant species possibly occurring on the south side are listed as sensitive by The Nature Conservancy: *Ceratophyllum demersum*, *Potamogeton robbinsii*, *Thlaspi arcticum*, and *Papaver alboroseum*. *Ceratophyllum demersum*

The Tule greater white-fronted goose (*Anser albifrons*), a subspecies of the white-fronted goose, is considered “at risk” by the International Waterfowl Research Bureau (NBS 1995), although they are not listed federally or by the state. This subspecies uses, and may breed in, wetlands adjacent to the Kahiltna River and Lake Creek (Ely et al. 1994). In 1995 new use areas were identified that include wetlands in the vicinity of the Tokositna Glacier and in wetlands along the Petersville Road (Ely et al 1994).

Vegetation

Smelowskia pyriformis is one of the most narrowly restricted alpine endemics in Alaska and is a species of concern under the Endangered Species Act. This species is also considered by The Nature Conservancy to be an “S2” species (i.e., it is imperiled in the state because of rarity or because of some factor(s) making it very vulnerable to extirpation from the state). The Nature Conservancy also considers the species to be imperiled globally. It is generally found in remote, unstable, calcareous scree in the southernmost Kuskokwim Mountains and in the western Alaska Range. This species appears to be closely related to *S. borealis*, but is not known to overlap with this species in geographical range; it also appears to be related to *S. ovalis* (USFWS 1995b).

Taraxacum carneocoloratum, or pink dandelion, is a species of concern under the Endangered Species Act. It is a composite found on alpine slopes and coarse, well-drained substrates. This species has been found in this general region of the Alaska Range (Murray and Lipkin 1987).

is listed as an “S2” species by the Nature Conservancy, although it is considered demonstrably secure globally. *Potamogeton robbinsii* is listed as an “S1” species by The Nature Conservancy; that is, it is thought to be

critically imperiled in the state because of extreme rarity or because of some factor(s) making it very vulnerable to extirpation from the state. It is, however, considered demonstrably secure globally. *Thlaspi arcticum* (Arctic penny cress) and *Papaver alboroseum* (pale poppy) are both listed as “S3” species by The Nature Conservancy. This listing means the species are rare or uncommon in the state. On a global level, both species are also considered very rare and

local throughout their range or found locally in a restricted range.

CULTURAL ENVIRONMENT

Humans have used the Susitna River basin for at least 10,000 years. Hunting and fishing have predominated. During recent historic times, the extraction of minerals has been the main activity in the area.

ARCHEOLOGICAL RESOURCES

When the first Euroamericans arrived in the upper Cook Inlet region in 1778, Athabascan Tanaina Indians inhabited the Susitna River and its drainages. Preferred village, camp, and activity sites were at the confluence of streams containing significant anadromous fish runs, especially where clear tributaries joined with turbid streams and rivers. Villages were also found at the outlets of lakes with significant resident and anadromous fish populations, at good fishing locations on lakeshores and stream banks, on relict stream and lake terraces, prominent hills, ridges, and overlooks, areas of game concentration, near margins of wetland areas, and along natural travelways such as waterways, ridges, portages, and passes. Additional criteria in site selection were level ground, good drainage, an adequate supply of firewood, and fresh water.

Evidence of past Native activities includes villages, camps, smokehouse locations, storage areas, butchering sites, caribou fences, hunting blinds, fish traps and weirs, burials and cemetery areas, lithic scatters, and trails.

No formal archeological surveys have been conducted in the specific area where the proposed or alternative actions would be implemented. The two most recent and comprehensive archeological studies of the general area were conducted in the early 1980s. One is reported by E. J. Dixon et al. (1985) in a series of studies entitled the *Susitna Hydroelectric Project Cultural Resources Investigations, 1979–1985*. The second is analyzed in an unpublished study by Alice J.

Lynch (1995), “Archeological Investigations of Five Remote Tracts of Land Within Denali National Park and Preserve, 1988, 1989.”

Nearly 250 new archeological sites were located during five field seasons of archeological survey. Ten sites/loci were assigned to Euroamerican tradition (AD 1900 to present), 114 sites/loci were assigned to Athabascan tradition (1,500 B.P. to about 19 B.P.), six sites/loci were assigned to the Northern Archaic tradition (about 5,200 to 3,500 B.P.), and seven sites/loci were assigned to the American Paleoarctic tradition (5,200 to 10,500 B.P.) (Dixon et al. 1985).

Probably the most important result of this research was the formation of a regional stratigraphic chronology based on a sequence of three distinct, prehistoric volcanic tephras (volcanic ash deposits) found in the area: Devil tephra, dated from 1,400 to 1,500 B.P.; Watana tephra, dated from 1,800 to 2,700 B.P.; and Oshetna tephra, dated from 5,200 to 5,900 B.P. When tephras are present in an archeological site, they are sufficiently distinct from other sediments and from one another that the archeologist can date the cultural strata in relation to the tephras. For example, artifacts recovered from below Oshetna tephra can be assumed to have been deposited before 5,900 B.P. The Susitna tephra sequence has been informally identified in sporadic locales throughout Denali National Park and Preserve. The effect these ash falls had on the prehistoric peoples and ecology of the region has been identified as an important future research question for the region (Saleeby 1984).

These investigations found archeological sites in the following settings and proportions:

Overlooks with water	46.9%
Overlooks	22.1%
Mineral licks	8.4%
Natural topographic	

constrictions	12.6%
Nonoverlooks with water	9.9%

Similar occurrences might be expected in the Chulitna River drainage and near Talkeetna. Sites at higher elevations might occur in other locations due to a difference in food gathering strategies.

In 1988 and 1989 the National Park Service conducted a survey in the Dunkle Mine unit, looking at the area from a historical archeological point of view. The 1988 survey of the Dunkle unit was completed in conjunction with the Cultural Resource Mining Inventory and Monitoring Program, incorporating the investigations of the mining claims on lands included in a state/federal exchange. A total of 8,401 acres in the Dunkle Hills area received pedestrian coverage during the 1988 and 1989 field seasons. Five historic sites (HEA-227 through HEA-231) were recorded within the boundaries of the Dunkle unit. All of the sites are associated with lode mining operations in the Dunkle Hills, dating from the 1920s to the early 1940s. The sites and cultural materials found are summarized in appendixes A and B of the Lynch report. One prehistoric site, HEA-232, was located adjacent to the mine unit.

HISTORIC RESOURCES

The first European exploration of the south slope of the Alaska Range came during the Russian occupation of Alaska in the early 1800s. At that time an employee of the Russian-American Company traveled up the Susitna River hoping to develop new areas to supply furs. Apparently the south side did not hold much promise for the company because the few small settlements that it established did not remain.

With the purchase of Alaska by the United States in 1867, a few miners and prospectors began to enter the area, but government-backed For many years the railroad was virtually the only means of reaching the north side of Denali National Park at McKinley Junction. The park established a formal entrance here in 1921, and

exploration did not occur until 1898 when a geologist, J.E. Spur, and a topographer, W.S. Post, from the U.S. Geological Survey approached Mount McKinley from the south to measure its elevation. Congress continued to mandate exploration in the area in response to a backlash of Klondike prospectors and the need to map routes to gold fields. The general area of the south side did not become easily reached until 1915–1920 when the Alaska Railroad was completed. A number of rail stops south of the Alaska Range allowed for limited town development and provided supplies for mining activities in Talkeetna (1920–1939) and in the lower elevations of the range, such as the Peters and Dutch hills and Denali fault.

In 1913 the U.S. Geological Survey reported on the 1905 discovery of gold in Peters Creek and its affluents near Peters Hills. Most of the claims were worked by one or two person outfits. Prospecting continued in the area through the 1920s and peaked in the mid-1930s with the operation of the Peters Creek Mining Co., under lease to Pat McDonald, Inc. The Petersville post office operated between 1936 and 1939.

Other influences in the Petersville area include the visitors who traveled there to take advantage of the spectacular views of Denali. Famed Alaska painter Sydney Laurence hiked some of the highlands in the Petersville region to find the sites from which to paint several of his most spectacular paintings of Mount McKinley and environs. The Matanuska-Susitna Borough Planning Department is exploring the possibility of having the Petersville Road designated a scenic byway. Currently the Cultural Resources Division of the Borough Planning Department is finalizing a site survey of the Middle Susitna area and intends to continue work on it in the spring.

a road into its interior was completed to Wonder Lake in 1937, and extended to Kantishna in 1938. Visitors wanting to take personal vehicles into the park brought them to McKinley Park

Station on the train. No entry point, road, or facilities were ever developed that provided access to the south side of Denali National Park. Completion of the George Parks Highway in 1971, which shortened the travel time between Anchorage and Fairbanks considerably, ushered in the age of tremendously increased visitation to the north side of the park, but it also made the small communities along the south side much more accessible and provided stimulus for isolated residential development and subdivision of some lands near the highway. A significant and critical portion of the lands south of the national park were permanently preserved by establishment of Denali State Park in 1970, which now contains 325,540 acres.

There are seven sites within or immediately adjacent to the national park that are listed on the Alaska Heritage Resource Survey. These sites are concentrated on the eastern boundary of the national park in the U.S. Geological Survey Talkeetna and Talkeetna Mountain quadrangles; several are within the railroad right-of-way easement and have historical significance in association with the development and operation of the railroad. The seven properties are Curry (also known as Dead Horse), Deadhorse Hill Roadhouse, Canyon Station, Chulitna Railroad Station, Sherman Railroad Station, Gold Creek or Susitna River Railroad Station, and the Susitna River Railroad Bridge, which is on the National Register of Historic Places.

Historic resources within the south side planning area that have been surveyed and found eligible for, or nominated to, the National Register of Historic Places include the following:

Windy Creek Cabin. This cabin in Denali National Park and Preserve, dates from the 1930s, when it was originally built as a park boundary patrol cabin. The Windy Creek cabin was nominated in 1985 and rehabilitated in 1992.

Curry Lookout. This facility, listed on the National Register of Historic Places, was built on Curry Ridge in 1923 by the Alaska Railroad to enable patrons to view the nearby mountains.

Talkeetna. The Talkeetna townsite was established as a national historic district and listed on the National Register of Historic Places in April 1993. The designation is associated with the 1920–1939 gold mining, railroad, and road construction period and includes 13 contributing buildings.

Long abandoned, with most of its physical remains removed, the site of the Dunkle Mine in Denali National Park and Preserve, was determined ineligible for the National Register of Historic Places; nonetheless, the site is considered a significant reminder of extensive mining activities of the early 20th century.

Due to the large expanse of the south side, not all of the area has been carefully surveyed to date; therefore, other historic resources of significance are likely to exist. Within Denali State Park, for example, few of the historic buildings and sites have been surveyed, including several areas classified for potential development.

SUBSISTENCE

In 1980, Congress established a framework for protecting subsistence uses by both Native Alaskans and non-Native Alaskans in Title VIII of ANILCA. Title VIII authorizes the state of Alaska to regulate subsistence uses on federal public lands if several requirements are met.

The state of Alaska managed statewide subsistence harvests until late 1989 when the Alaska Supreme Court ruled that the rural residency preference required by federal law violated the Alaska Constitution. Two separate management systems were in place following establishment of the federal subsistence management program in 1990. Each operates under individual legislation and enforces separate regulations. The federal government, through the Federal Subsistence Board, manages subsistence resources on federal lands, and the state of Alaska, through the Boards of Fisheries and Game, manages subsistence resources on nonfederal lands.

Both state and federal laws define subsistence as the “customary and traditional” uses of wild resources for food, clothing, fuel, transportation, construction, art, crafts, sharing, and customary trade. Customary and traditional uses of fish and game are important to Alaskans from diverse cultural backgrounds.

State and federal laws differ in who qualifies for subsistence uses. Currently, all state residents qualify for subsistence fishing and hunting under state law. Under federal law, local rural residents qualify for subsistence fishing and hunting on park lands in Alaska.

Two separate subsistence discussions follow: one for subsistence resources and uses on Denali National Park and Preserve (federal lands) and the other for subsistence resources and uses on nonfederal lands.

Federal subsistence use on the south side of the national park occurs primarily, if not

DENALI NATIONAL PARK AND PRESERVE

Portions of Alaska game management units 13E, 16A, and 16B lie within the 1980 ANILCA park additions of Denali National Park and Preserve.

Subsistence uses are allowed within the 1980 additions to Denali National Park and Preserve in accordance with Titles II and VIII of ANILCA. Section 202(3)(a) of ANILCA authorizes subsistence uses within the 1980 additions to Denali National Park, where such uses are traditional. Lands within former Mount McKinley National Park are closed to subsistence uses. The 1980 additions to Denali National Preserve are open for federally authorized subsistence use and state-authorized general hunting and fishing.

Local rural residents of the “resident zone communities” of Cantwell, Lake Minchumina, Nikolai, and Telida are eligible to pursue subsistence activities in the 1980 park and preserve 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 and preserve additions may continue to do so pursuant to a subsistence permit issued by the park superintendent in accordance with federal law and regulations.

About 320 local rural residents currently qualify for subsistence use activities within Denali National Park and Preserve. About 161 subsistence users reside in the south side study area, of which, about 151 live in the Cantwell vicinity. Windy Creek, Cantwell Creek, Bull River, and Dunkle Hills are important subsistence use areas within Denali National Park and Preserve.

exclusively, on national park lands in the Broad Pass region, and secondarily, on national preserve lands in the Yentna River drainage.

South side subsistence users depend largely on moose, caribou, ptarmigan, spruce grouse, hare, and a few species of freshwater fish. Large mammals account for 70% of the resources used, and fish account for 21%. Marten, mink, red fox, wolf, lynx, weasel, wolverine, land otter, beaver, muskrat, and coyote are important fur animal resources. Subsistence hunting for moose and caribou occurs from August through September, a time that coincides with popular recreation visitation.

The National Park Service recognizes that patterns of subsistence use vary from time to time and from place to place depending on the availability of wildlife and other renewable natural resources. A subsistence harvest in a given year may vary considerably from previous years because of weather, migration patterns, and natural population cycles.

No federal subsistence use is known to occur on Denali National Park lands within the Chelatna Lake region, Dutch and Peters Hills region, or the upper Tokositna drainage.

STATE/BOROUGH LANDS IN THE SOUTH SIDE STUDY AREA

The south side lies within Alaska game management units 13(E), 16(a), and 16(B). Subsistence uses of fish and wildlife resources are authorized by state law in units 13(E) and 16(B). Under current state regulations, all Alaska residents qualify as subsistence users of fish and wildlife resources in areas where subsistence uses are authorized. Unit 16(a) is part of the Anchorage/Matanuska-Susitna/Kenai nonsubsistence area, which means that dependence on subsistence is not a principal part of the economy, culture, and way of life of the area. Consequently, the subsistence priority does not apply to unit 16(a) (see 5 AAC 99.016).

The Alaska Department of Fish and Game, Division of Subsistence, documented subsistence use patterns of south side communities in studies conducted in the 1980s, which included mapping of areas used for seasonal resource harvesting.

The community of Cantwell and residents living along the Denali Highway make extensive use of areas south of Cantwell to the Chulitna Pass/Hurricane Gulch/Byers Lake areas; east to the Nenana River, to the Susitna River where it branches into west and east forks, and to the Maclaren River.

Skwentna residents harvest resources in a portion of the area south and west of the Kahiltna River and Chelatna Lake in unit 16(B).

Another group consists of dispersed households in that portion of unit 13(E) along the Alaska Railroad north of Talkeetna to the Hurricane-Broad Pass area on the George Parks Highway south of Cantwell. Resource harvesting on the south side occurs mostly in unit 13(E) in the Chulitna and Susitna river drainages, along the George Parks Highway and Alaska Railroad corridors between Cantwell and Talkeetna, and along the western side of the Denali Highway.

In rural Alaska, the annual wild food harvest is about 375 pounds (lbs) per person per year. This exceeds the south side area’s per capita annual harvest range of less than 100 lbs to slightly over 200 lbs based on Alaska Department of Fish and Game studies in the 1980s. In contrast, harvest in areas off the road system can range as high as 500–800 lbs per person per year; while in urban areas a figure of 22 lbs per person per year is common. For households in the study area that are closer to Anchorage, the majority of harvest tends to be fish. Farther to the north, e.g. Cantwell, harvest of land mammals dominates. About 1% or 2 % of the total harvest is from plants, primarily berries. Much of the subsistence harvest is shared among community members. See table 7 for additional information.

TABLE 7: MAJOR RESOURCES HARVESTED IN THE SOUTH SIDE STUDY AREA

	<u>Percent Households Harvesting/Percent Households Using</u>					
	Cantwell	Trapper Creek	Upper Peters- ville Road	Chase	Gold Creek- Chulitna	Hurricane- Broad Pass
No. Households Interviewed	43	19	17	17	5	8
Study Year	1982–83	1985–86	1985–86	1986	1986	1986
Resource:						
King salmon	9/9	37/58	29/47	41/47	40/40	25/50
Red salmon	7/7	29/47	29/35	41/47	40/40	62/75
Silver salmon	16/16	63/84	59/82	53/65	60/60	38/38
Lake trout	37/37	0/0	0/0	0/0	0/0	25/38
Rainbow trout	12/14	58/58	41/53	8/78	80/80	38/38
Grayling	77/77	58/58	24/41	65/65	80/80	63/63
Burbot	12/12	0/0	18/18	12/12	20/20	13/13
Moose	28/61	5/53	24/71	53/77	20/100	50/88
Caribou	30/33	5/10	6/6	13/18	20/20	3/13
Black bear	2/2	0/5	12/12	12/24	40/40	13/38
Hare	44/44	5/5	12/12	41/41	40/40	13/13
Fox	12/12	0/0	12/12	6/12	0/0	25/25
Marten	2/2	0/0	12/12	18/18	0/0	25/25
Beaver	5/5	0/0	17/24	18/18	0/0	25/25
Spruce grouse	21/21	32/37	53/59	71/71	60/100	25/25
Ptarmigan	72/70	10/16	24/35	41/47	60/80	38/38
Ducks	5/5	5/5	12/18	77/77	30/40	13/13
Berries	67/70	84/84	77/77	88/88	80/80	88/100
Other plants	9/14	42/47	59/59	82/82	80/80	88/88
Mean HH harvest in lbs.	378	207	423	554	348	600
*Community per capita harvest	130	66	167	209	174	178

*Compare community per capita harvest figures for Talkeetna (55 lbs in 1985–86); Homer (104 lbs in 1982); Copper Center (113 lbs in 1982); and Tyonek (272 lbs in 1982–83).

SOURCES: ADFG 1984b, 1987, 1988.

SOCIOECONOMIC ENVIRONMENT

MATANUSKA-SUSITNA BOROUGH

Most of the land on the south side is in Matanuska-Susitna Borough (the northern portion near Cantwell is in Denali Borough). The south side cooperative planning area in the borough extends along a southwest-northeast axis between Chelatna Lake and the Nenana River near Cantwell. There are 16 communities in the borough, although only 3 (Wasilla, Palmer, and Houston, which are all south of the planning area) are incorporated. Trapper Creek, Petersville (defined in the U.S. Census and this document to include Peters Creek), and Talkeetna, (principally affected communities in regard to the alternatives considered in the environmental impact statement) are all unincorporated. However, they are officially represented by advisory community councils established by Matanuska-Susitna Borough.

Population

Matanuska-Susitna Borough population more than doubled during the decade of the 1980s. The population has continued to grow rapidly, increasing from 39,683 in 1990 to 48,684 in 1994 or 22.7%, according to the U.S. Census. In contrast, the state of Alaska population increased by 10.2% during the same time period. The Alaska Department of Labor projects continued rapid growth (between 4% and 6% per annum) in Matanuska-Susitna Borough population through 2000. Population density for Matanuska-Susitna Borough is extremely low at 1.6 persons per square mile.

Housing

Unemployment rates in the Mat-Su Borough have typically exceeded statewide levels. According to the Alaska Department of Labor, the 1993 labor force amounted to 20,821 persons, of which 18,309 were employed and 2,512 were unemployed. Thus, the average

The number of housing units in Matanuska-Susitna Borough increased from 10,098 in 1980 to 20,953 in 1990. Of the 1990 total 4,479 or 21% were for seasonal, recreational or occasional use compared to 7% statewide. The 1990 median value of owner-occupied housing in the borough was \$71,500, which is lower than the state average of \$94,000. The 1990 vacancy rate for renter-occupied housing was 11.5%. Median contract rent in 1990 was \$430 per month, which is also lower than the state average of \$503 per month.

Economy

The Matanuska-Susitna Borough is historically an agriculture and mining region; however, neither dominate the economy today. According to a "Trends Profile – Matanuska-Susitna Borough," *Alaska Economic Trends*, September 1994 (Fried 1994), the borough sends many (39% in 1990) commuters to work outside it each day. Most of these work in Anchorage, 40 miles south of the border. Others work in other areas of the state, beyond a daily commute. About 40% of the income earned by residents is earned outside the borough.

Total employment has been growing steadily during recent years. In 1993 there were 15,148 full- and part-time jobs in Matanuska-Susitna Borough, increasing from 11,496 jobs in 1988, or 31.8%, as shown in table 8. Much employment is concentrated in trade, services, and government. Also notable are construction and transportation and public utilities industries. Growth in the visitor industry has contributed to recent job gains in these sectors.

unemployment level for the borough stood at 12.1%. The comparable statewide level was 7.8%. A similar pattern occurred during the previous three years, with borough unemployment levels ranging from 12.3% to 14.4%, compared to 7.0% to 9.2% statewide.

Total personal income for the Matanuska-Susitna Borough in 1993 amounted to \$767.1 million or \$16,506 per capita. The statewide and U.S. per capita figures for the same year were \$23,070 and \$20,800, respectively.

Thus, per capita personal income for Matanuska-Susitna Borough was about 72% of the statewide per capita figure and 79% of the U.S. per capita figure.

**TABLE 8: FULL- AND PART-TIME EMPLOYMENT BY MAJOR INDUSTRY
MATANUSKA-SUSITNA BOROUGH, 1988–1993***

Industry Sector	1988	1993	Percent Change 1988–1993
Total Employment	11,496	15,148	31.8%
Farm	351	338	-3.7%
Agric. Serv., Forestry, Fisheries, Other	494	489	-1.0%
Mining	56	263	369.6%
Construction	736	1,256	70.7%
Manufacturing	241	270	29.5%
Transportation and Public Utilities	887	1,153	30.0%
Wholesale Trade	153	300	96.1%
Retail Trade	2,185	3,072	40.6%
Finance, Insurance, and Real Estate	806	793	-1.6%
Services	2,982	3,074	3.1%
Government	2,605	3,074	18.0%
Federal, Civilian	103	119	15.5%
Military	350	419	19.7%
State and Local	2,152	2,536	17.8%

* Employment by place of work; includes wage and salary and proprietors categories.

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System, Table CA25, May 1995.

Land Use

The vast majority of the south side planning area is undeveloped land used for dispersed recreational activities and subsistence, concentrated near the road corridors, and for mining in more remote areas. Aside from these activities, much of the study area receives little to no use during the course of a year. A few areas and scattered sites are used for residential. There is relatively little mining activity in the Petersville area currently. According to one

activities, and there are small commercial areas and sites, mostly concentrated in the unincorporated communities and at scattered sites along the George Parks Highway. Some places within the planning area have been used intensively for mining in the past, such as in the Dunkle Hills and near the end of the Petersville Road.

local miner active in the area for several decades, there are few active miners now.

Perhaps a half dozen miners are working three to four small mining operations in a given year. Most of these operations are active between mid-May and mid-October. The miners stay in the area most of the time; supplies are routinely brought in by airplane. Most of the miners have been active in the area for a long time and have built cabins or located trailers at the claim sites. The mining operations are quite dispersed with distances of 2–3 miles separating each other. Apparently there has been no damage to claim sites including dwellings from other users.

Existing mining activity, which involves surface mining, is not likely to result in the discovery of new ore bearing deposits, according to a respected mineral development expert (Chuck Hawley of Hawley Resource Group) in Anchorage. However, the potential for substantial production of gold bearing ores is quite high from deeper channels lying in bedrock buried beneath glacial material. A gold production bonanza similar to that at Valdez Creek could take place in the Peters Hills area. In the former case, secondary mining of bedrock covered by glacial materials resulted in the recovery of 500,000 ounces of gold. As a rule of thumb applied by mineralogists, the prior existence of minerals suggests that more are likely to be found. Usually a geologist will reason that it is highly likely to find placer gold where such mines have previously existed. This suggests that mining would continue in the Peter Hills area for the foreseeable future.

There are numerous mining claims filed on state selections along the Petersville Road that will become valid upon land conveyance from the federal government. State land management plans and policies will support the maintenance of mining activities and will provide direction on measures to avoid conflicts with other land uses.

The state plans to accept title to three federal mineral surveys along the Petersville Road in early 1997. The state is currently working with the Department of Transportation and Public Facilities, local mining claim holders, and the Matanuska-Susitna Borough to identify what

portion of these federal mineral surveys should be subject to a leasehold location order to maintain reasonable opportunities to upgrade and extend the road.³ As road siting and design decisions are made, the area of the leasehold location order will be further reduced as appropriate. Management through leasehold location allows the state greater management flexibility over surface activities on state mining claims to protect the road corridor.

Another related issue involves the existence of RS 2477 rights-of-way near the site of the proposed Tokositna facilities. There is one RS 2477 right-of-way in the vicinity of the proposed site. The rights-of-way are identified by the state of Alaska; they are on state land and under the authority of the state of Alaska. The state could move a RS 2477 right-of-way if it were in the way of an improvement to be undertaken by the state. Nonetheless, the state of Alaska is not planning on any changes in alignments to existing RS 2477 rights-of-way in the area concerned.

The Matanuska-Susitna Borough is currently updating its comprehensive land use plan. The plan is being developed at the community level. The Matanuska-Susitna Borough Planning Commission passed a resolution in May 1993 in which it set forth guidelines for the development of such plans on a community by community basis. The borough comprehensive plan will ultimately be a compilation of the various community plans.

3. A leasehold location is a claim that is located in an area that is restricted to leasing. The staking requirements for a leasehold location are the same as those for a mining claim. However, a leasehold location must be converted to an upland lease before mining begins.

The Matanuska-Susitna Borough has implemented a limited form of zoning that mostly refers to placement of structures on sites. They also have a subdivision ordinance that regulates the subdividing of land. Land use zoning by type of use has been limited to special land use districts such as for land within Denali State Park. That special use district is zoned for recreational uses. Permitted uses include (1) public campgrounds, playgrounds, play and sports fields, trails, boat channels, public buildings, public visitor centers and other public facilities and uses in keeping with public recreation; (2) one single-family dwelling per lot; (3) the raising of vegetables, produce, and fruit crops; (4) storing, repairing, or using farm equipment; (5) home occupations; (6) temporary living quarters on the same premises with a dwelling under construction; and (7) customary accessory uses and buildings, provided such uses are clearly incidental to public recreation and with the provision that any accessory building or use be located on the same lot with the principal building. Conditional uses include (1) two-family dwellings; (2) multiple-family dwelling with three or more units; (3) group homes; (4) churches and related buildings; (5) commercial uses; (6) private campgrounds; (7) RV parks; (8) highway maintenance yards; (9) public gravel pits; and (10) group camps. Prohibited uses and structures within the special use district include (1) mobile homes, except as permitted temporarily (as noted above); (2) mobile home parks; (3) industrial uses not listed as permitted or conditional uses; (4) junkyards, salvage yards, and automobile wrecking yards; and (5) landfills and refuse areas. Recently, Princess Tours obtained a conditional use permit for a proposed hotel development on a 148-acre site it owns within the Denali State Park special use district.

The Matanuska-Susitna Borough is developing two corridor management plans as part of its ongoing planning efforts. These plans seek to balance the use, enjoyment, and economic opportunities of the borough's scenic highways. The borough is developing a corridor management plan for the Petersville Road and will soon begin a similar planning effort for

portions of the George Parks Highway. A future plan will address the Denali Highway. The corridor management plans will allow the affected communities to consider the various ways of using and benefiting from the scenic highway corridor while developing management guidelines to maintain the integrity and values of the highway.

The corridor management plans are developed by a process similar to the manner used by the borough in updating its comprehensive plan. A planning team composed of residents of the affected community and users of the highway assist in developing the plan. These individuals develop the goals and priorities for how the highway is to be managed and develop the recommendations for management guidelines. The management guidelines may include a variety of measures including vegetative buffers, road design criteria, pullout identification, zoning, and conveyance language. They also may address safety and ways of making the roads more convenient to use by existing visitors and residents. The planning effort includes public participation in the form of public meetings where the plan is discussed and comments are received and through formal public hearings by both the Borough Planning Commission and Assembly. Both the plan and the method(s) in which it is implemented must be adopted by ordinance.

The Petersville Road corridor management plan would identify the land use management guidelines needed and provide for mechanisms that would be used to implement the guidelines. It is expected that the corridor management plan will be in final draft form by the end of 1996. The key recommendations provide for improvements to highway design (particularly regarding safety and speed); location of pullouts for scenic views; distribution of information about the road and bike/pedestrian paths, ATV and snowmachine trails; protection of parking areas now being used by land owners (who do not have road access, and therefore, must leave their vehicles along the Petersville Road); installation of receptacles and trash removal at parking lots; development of parking lots with

sanitary facilities for snowmachiners; and establishment of scenic buffers.

Currently the Matanuska-Susitna Borough Assembly is considering viewshed protection along the Petersville Road. The borough recently instituted a junk car removal program that could be used to maintain scenic values on the road corridor. Existing zoning ordinances require a conditional use permit to operate a commercial junk yard. Other types of restrictions or regulations will have to result from either the comprehensive or corridor management plans. While new zoning regulations are unlikely to be recommended by the Petersville Road corridor management plan, viewshed protections could be recommended.

Other ideas that have been recommended in regard to land use planning include consolidating the 300-foot scenic buffer (150 feet on each side of the road). The present buffer is only on Matanuska-Susitna Borough lands. The borough plans to recommend that the state of Alaska designate scenic buffers on state lands for larger areas along the road between the Forks Roadhouse and a point about 8 miles from the Denali State Park boundary in order to protect the entire viewshed. A further recommendation is for a 300-foot scenic buffer on state land designated for the last 8 miles of the Petersville Road up to the Denali State Park boundary. Another land use proposal is to encourage commercial development at locations on existing private lands and to restrict the use of lands through the use of deed restrictions on public land conveyances.

Under the proposed action, the state would amend the *Susitna Area Plan* with the intention of banning new state land disposals along the Petersville Road. The state could further trim the current list of potential land disposals in this area as identified in the *Susitna Area Plan*. These areas are in the general Petersville Road corridor, but set back from the road. Over the short term, land disposals are not an issue because the state land disposal program has been suspended due to staff reductions. The state does not expect to have budgeted funds to

plan, survey, appraise, or sell new land subdivisions for many years.

Additional issues such as locations of trails, trailheads, and parking will be addressed in subsequent planning, such as that done prior to Petersville Road improvements and to address recreational issues and activities.

There is also consideration by the state of Alaska to designate portions of the George Parks Highway as a state scenic byway. The Petersville Road could also be so designated. State designation of a road as a scenic byway carries with it no specific required regulations. When a road segment is designated a scenic byway, however, a plan is developed so that the public and land managers along a designated segment can ensure that the scenic resources are considered.

Once a road segment is designated, signs noting that fact are put up. The benefits of such designation include: projects involving visitor amenities (e.g., restrooms, pullouts, interpretive signs) along the road are given higher priority by the state Department of Transportation and Public Facilities. Local communities benefit economically from the construction work involved with providing these amenities and from the increased tourism due to publicizing the road's designation.

With borough support, portions of the George Parks Highway (possibly from mile 70 to mile 257) will be considered for designation as a scenic byway. The state expects to undertake public meetings on the proposal later this year. Corridor management planning undertaken by the borough for portions of the highway will be an integral part of the scenic highway designation process.

Landownership along the George Parks Highway

Landownership along the George Parks Highway is divided among federal, state of Alaska, University of Alaska, Matanuska-Susitna Borough, Native corporations, and private interests. A general discussion of the status of ownership for given locations is provided below based on maps and other information assembled by the Alaska Department of Natural Resources, Division of Parks and Outdoor Recreation, Matanuska-Susitna Borough, and Cook Inlet Region, Inc. Beginning from the south, landownership between Caswell and the Talkeetna spur road junction is mixed, with most of the land in private hands. Nonetheless, several large parcels within a mile of the highway are under the Matanuska-Susitna Borough, the state, University of Alaska, or Native corporation ownership. Between the junction and the highway bridge crossing the Susitna River, landownership remains mixed; however, major portions are owned by the Matanuska-Susitna Borough and the state of Alaska. Beyond that point to the Trapper Creek area, landownership is held exclusively by the Matanuska-Susitna Borough and the state of Alaska. The area surrounding the Trapper Creek intersection with the George Parks Highway consists of Matanuska-Susitna Borough and private ownership. The area north of Trapper Creek to the southern boundary of Denali State Park is in Matanuska-Susitna Borough, state of Alaska, and federal ownership. Of course, most of the state park is in state of Alaska ownership. Within the state park boundaries there are a variety of large and small privately held properties. The area north of Denali State Park to Broad Pass is in federal and state of Alaska ownership.

Proceeding farther north, Ahtna, Inc. and Cantwell Native Village lands are located in the Broad Pass and Cantwell areas. Major areas within the George Parks Highway corridor south of Summit in the Matanuska-Susitna Borough are owned by the Cantwell Native Village. The Cantwell Native Village also has substantial land holdings at the town of Cantwell, and along the George Parks and Denali Highway corridors north and east of

Cantwell. The land holdings north of Cantwell follow the highway to the Denali National Park and Preserve park entrance. Extensive land holdings of Ahtna, Inc. also are located east of the George Parks Highway in the Matanuska-Susitna Borough and north of the Denali Highway in the Denali Borough. The Denali Borough currently owns no land, although it is in the process of selecting its entitlement from available state lands within borough boundaries.

The Matanuska-Susitna Borough has estimated the amount of acreage for each ownership category in the George Parks Highway corridor. The acreage have been calculated to include land holdings within 100 feet on each side of the right-of-way, and thus reflect only land holdings immediately adjacent to the road. The acreages are as follows: federal – 9,793 acres; state of Alaska – 54,644 acres; state selected – 13,764 acres; Matanuska-Susitna Borough – 12,184 acres; Matanuska-Susitna Borough Selected – 11,100 acres; University of Alaska – 391 acres; Native corporation – 224 acres; and private – 27,646 acres.

Landownership along the Petersville Road

The Alaska Department of Natural Resources, Division of Parks and Outdoor Recreation, assembled information on landownership adjacent to the Petersville Road corridor (see the Landownership – Petersville Road Area map). The area between Denali State Park in the northwestern portion of the map and Petersville is in federal and state government ownership. However, mining claims have been established on most of the federal lands and portions of state-owned lands. Four federal mining claims are located in one quarter-section of section 22 inside Denali State Park (see map). There are no privately owned lands indicated within the immediate area. In fact, the closest private land along the road corridor is at the Forks Roadhouse, at about mile 19, or about 20 miles southeast of the Peters Hills (proposed Tokositna site) area.

AFFECTED ENVIRONMENT

A sizable portion of land area at Petersville (section 28) is owned by the Matanuska-Susitna Borough. Most of the land in the adjacent corridor between Petersville and Peters Creek to the south is owned by the state of Alaska.

Again, there are mining claims in the area immediately south and a small claim to the west of Petersville. In addition, there a number of parcels that are privately owned, originating from patented federal mining claims, west of Petersville in the backcountry. Along the road, at Peters Creek, there are a few privately owned parcels, a tract owned by the Matanuska-Susitna Borough, but most of the land area is owned by the state of Alaska. Heading east between Peters Creek and Kroto Creek there are

Landownership - Petersville Road Area map

several subdivisions on opposite sides of the Petersville Road, some extending 2–3 miles into remote areas. There is also a small privately owned parcel at Kroto Creek. Most of the adjacent area, however, is owned by the state of Alaska. Between Kroto Creek and Gate Creek there are numerous privately owned parcels and one large subdivision on the north side of the Petersville Road as well as extensive state-owned lands in the corridor. Just beyond Gate Creek there are several large privately owned land parcels on the north side of the Petersville Road and several tracts of land owned by the University of Alaska located on both sides of the road.

Proceeding farther east beyond Gate Creek, there are major land holdings on both sides of the road owned by the Matanuska-Susitna Borough as well as several privately owned parcels and sub-divisions located near Scotty Lake, in addition to surrounding areas owned by the state of Alaska. The built-up area at Trapper Creek adjacent to the Petersville Road is largely in private ownership. Large areas on the periphery of the Trapper Creek community are owned by the Matanuska-Susitna Borough.

The Matanuska-Susitna Borough has estimated the amount of acreage for each ownership category in the Petersville Road corridor. The acreage have been calculated to include land holdings within 100 feet on each side of the right-of-way, and thus reflect only land holdings immediately adjacent to the road. The acreage are as follows: state of Alaska – 33,665.5 acres; Matanuska-Susitna Borough – 4,270.7 acres; Matanuska-Susitna Borough Selected – 1,058.1 acres; private – 3,487 acres; and other (lake) – 512.8 acres.

Public Services

The Matanuska-Susitna Borough is a second-class borough, incorporated in 1964. It has a seven-member assembly and a directly elected mayor. The school board and planning and zoning commission also have seven members each. The Matanuska-Susitna Borough exercises

areawide, non-areawide, and service area powers to provide for the various public facilities and services. Areawide and non-areawide functions are financed from taxes levied on taxable properties in the borough. Areawide functions that the borough must perform include education, assessment and taxation, and planning. The borough has also elected to provide parks and recreation, ambulance service, ports and harbors, and historic preservation functions on an areawide basis. Special service areas have been established to provide ambulance, fire, road, flood, water and sewer, and erosion control services.

The borough imposes a property tax, a special 5% hotel/motel tax, but does not impose the optional general sales tax.

TALKEETNA COMMUNITY

The small unincorporated town of Talkeetna is located about 15 miles off the George Parks Highway and about 114 miles north of Anchorage. The town lies at the end of the Talkeetna spur road near the confluence of the Talkeetna, Chulitna, and Susitna Rivers. Talkeetna is a station stop on the Alaska Railroad at about mile 227. There is a general aviation airport. Talkeetna is the traditional departure point for Mount McKinley mountaineering expeditions.

The town originated as a supply station for miners and mining camps in the area. Later construction of the Alaska Railroad established the town as a transportation center for the upper Susitna River valley, a function that was augmented in 1941 when the Talkeetna airport was built by the Civil Aeronautics Authority, the predecessor of the Federal Aviation Administration. In 1965 the Talkeetna spur road was constructed, which linked the town to the George Parks Highway and allowed motor vehicle traffic into town.

Population

The Talkeetna population has fluctuated over the years, based on availability of work locally. However, from 1980 to 1990 the population in the townsite core area actually declined by 14 residents (dropping from 264 persons to 250 persons). During the same period, population growth in the outlying area was quite rapid, rising from 376 persons to 557 persons for an annual average rate of growth of 4.0%.

The 1990 census population of the Talkeetna planning area, estimated at 557 persons in 224 households (including one person households), includes surrounding community residents of about a 24-square-mile area. The corresponding figure for the townsite area, as noted, was 250 residents. Residents in the area, outside the townsite, use Talkeetna as a source for supplies, for a mail stop, for schools, and as a social gathering place. In 1994, according to the "Draft Talkeetna Comprehensive Plan, June 1995," the Talkeetna area population had grown to 651 persons, with the townsite area population growing to 287 persons, reversing the downward trend from the previous decade.

A 1991 community survey indicated that 57% of those interviewed had lived in the Talkeetna area for more than 10 years and another 21% had lived there for 6–10 years. This suggests a stable social environment.

Housing

In 1990 there were 168 housing units in the Talkeetna townsite and 344 units in the entire planning area. Sixty-seven percent of the units in the townsite were occupied and 32.1% vacant. Of the 1990 total in the townsite, 25 units, or about half of all vacant units, were for seasonal, recreational, or occasional use. The percentages of occupied and vacant units were about the same for the planning area. The 1990 median value of owner-occupied housing in the townsite was \$66,300, which is lower than the borough average of \$71,500. The 1990 vacancy rate for renter-occupied housing in the townsite

was 18.8%. Median contract rent in 1990 was \$283 per month, which is also lower than the borough average of \$430 per month.

Although there are few vacant parcels of land within the Talkeetna townsite, according to the "Talkeetna Visitor Center Impact Assessment" (Transport/Pacific Associates et al. 1992), there is a large surplus of available building sites in the immediate area. These vacant sites could accommodate significant population growth.

Economy

Talkeetna's major industries include the transportation industry, the trade and service industries, the communication industry, and government. According to a 1989 Matanuska-Susitna Borough employment survey and the 1990 U.S. Census, there were about 220 employed persons in the Talkeetna community, of which 144 (65%) work within the area and 76 (35%) commute out-of-area to work. Of workers living and employed in the area, 44% work in trade and services, about 23% work in transportation, about 26% work in professional and related services (including government), and about 7% work in communications and other public utilities. According to the borough survey, nearly two-thirds of resident workers (employed in retail trade, services, and transportation) are employed in tourism-related industries.

Many Talkeetna residents work in numerous and diverse trades. In addition, many local businesses are many-faceted which makes them difficult to classify. Further, many of Talkeetna's residents depend on a wide range of economic activities, some nonmonetary, to enable them to live independently. Some residents rely on locally caught fish and game, locally grown garden produce, arts and crafts sales, or seasonal employment to supplement their incomes. According to the 1990 census, median family income for Talkeetna residents was \$35,156 compared to \$40,745 for the borough, and \$41,408 for the state.

Tourism is Talkeetna's main industry. The air transportation industry out of Talkeetna serves three main user groups: flightseers; mountain climbers; and hunters/recreation hikers. Sportfishing, boating, hunting, hiking, and winter sports like cross-country skiing, dog mushing, and snowmachining are all popular in the area.

A survey completed in April 1992 identified the following major established businesses: four flight services, five riverboat/rafting/guiding services, eight hotel/motel/bed and breakfast establishments, five restaurants, and 11 retailers. Virtually all of these businesses had some relationship to tourism and many depended exclusively on it. Since 1992 the number of flight services has increased to six. According to information provided by the local chamber of commerce, the number of beds, particularly from bed and breakfast establishments, has increased by a third since the survey was conducted.

Mountaineering-related visits to Talkeetna have been increasing steadily during recent years. Attempts to scale Mount McKinley, South Peak, have risen from 645 in 1985 to 1,277 in 1994, doubling over the period. Total attempts for 1995 were 1,220. Added to this figure were about 90 attempted climbs on other peaks.

About 40,000 persons visited Talkeetna in 1990, based on "Talkeetna Visitor Center Impact Assessment" (Transport/Pacific Associates et al. 1992). The report provides projections of visitation (to the then proposed Talkeetna NPS visitor center) between 1994 and 2003. The 1994 projection was for 49,000 visitors. Interviews with local residents and community representatives in Talkeetna suggested that tourism-related visitation has been growing fairly rapidly during recent years by as much as 10% per annum, although one business source indicated that visitation was down slightly in 1995. Accordingly, flight operations (most related to Denali National Park and Preserve flightseeing) have been growing at about 10% per year.

While many of the people living in Talkeetna have moved there for reasons other than employment opportunities, there seems to be general satisfaction with the level of activity and general character of the tourism industry. Many residents are interested in maintaining the rural, safe, and relatively self-sufficient lifestyle that the area offers. These residents see encroaching urbanization and development as conflicting with what they value in Talkeetna.

The lack of jobs is probably the most significant limitation to growth in the area. Although many residents view growth negatively, a large number believe that unless additional job opportunities are generated in the town, many residents may be forced to leave.

Land Use

Like the rest of the borough, the Talkeetna planning area is mostly undeveloped land with limited uses. There are residential and commercial activities concentrated in the townsite, with scattered residential sites along the roads elsewhere in the Talkeetna planning area.

The Talkeetna Community Council recently completed a review draft "Comprehensive Land Use Plan," dated June 1995. The plan provides detailed information on a broad range of topics including background information on social and economic environment, natural and physical environment, and existing landownership and management; and provides discussions of issues and recommendations for a land use plan; a transportation plan; a public facilities and services plan; and implementation. The new Talkeetna comprehensive plan, when adopted by the Matanuska-Susitna Borough Assembly, will update and supersede the existing Talkeetna plan component of the Matanuska-Susitna Borough comprehensive plan that was adopted in 1970 and is now being revised.

Public Services

Talkeetna has an active community council with five elected members. The council is involved in overseeing municipal activities and represents the community's interests before the Matanuska-Susitna Borough Assembly and other governmental agencies. Four service areas in the Talkeetna planning area perform water and sewer, fire protection, road maintenance, and water erosion and flood control functions. The service area functions are funded by special property taxes levied within the respective service areas. Education is an areawide function provided by Matanuska-Susitna Borough. The Alaska State Troopers provide police protection. The Alaska Department of Transportation and Public Facilities manages the Talkeetna airport.

Water and sewer service is provided on a user-fee basis. Water supply comes from a drilled well and large booster pump. There is little storage capacity. Flood control measures are needed to guarantee safe water quality. Sewage treatment is provided in a lagoon system located northwest of the Talkeetna airport runway. The collection system extends south to the municipal library, east to the built up area near the airport, and north to the village center. The system was upgraded recently under a three-phase improvement program. There is plenty of available capacity in both water and sewer systems. The system was designed for 600 connections, based on sewage treatment capacity. According to the Talkeetna comprehensive plan, as of April 1994 there were 82 water connections and 76 sewer connections.

Road maintenance is also provided from a service area property tax levy. Talkeetna's road network is extensive and poorly constructed, which creates high maintenance and upgrade costs. The Greater Talkeetna Road Service Area maintains 73.9 miles of roads. The Alaska Department of Transportation and Public Facilities maintains the Talkeetna Spur Road, Comsat Road, and Christiansen Lake Road, for a total of about 20 miles.

Fire protection and emergency medical services are provided by the borough through the

Talkeetna Fire Service Area. The fire service area encompasses about 40 square miles, extending from the west townsite to the Parks Highway. Emergency medical services are provided by the borough on an areawide basis. The fire department is all volunteer. Including emergency medical services and rescue services, there are 18–20 volunteers. There are two fire stations — one is on the Talkeetna Spur Road, north of the Talkeetna Elementary School; the other is on the George Parks Highway at the Sunshine Community Center Building. Fire-fighting and emergency medical service equipment includes three engines, two tankers, one jeep, one trailer, and two ambulances. The Talkeetna Fire Service Area is supported by an all volunteer response team.

Talkeetna's public library is located on Talkeetna Spur road, ½ mile from the village center. The library function is an areawide service provided by the borough with 10% of operating costs paid by the state. The library is staffed by a librarian, on-call personnel, and volunteers. The library is open 40 hours per week.

The Talkeetna Historical Society Museum is owned and operated by the Talkeetna Historical Society, a nonprofit organization. The museum receives numerous visitors from packaged tours offered by Anchorage-based companies.

Parks and recreation are provided as an areawide responsibility of the borough, although Talkeetna residents contribute volunteer time and effort to improve facilities. Local resident participation in recreation-related activities is high. Established park facilities located in the planning area include Village Park, River Park, Talkeetna River boat launch and campground, and Christiansen Lake Park.

There are about 20 miles of cross-country ski and hiking trails constructed by the Talkeetna Chamber of Commerce and maintained by local skiing groups.

Health and cemetery services are provided by a private physician and the Talkeetna Cemetery. The Talkeetna Elementary School is located on a 5-acre site on the Talkeetna Spur Road, about ¼ mile south of the village center. The school is outdated given its age and limited capacity. The school district has a \$6.3 million capital improvement project for an addition and renovation of the school. The school was originally designed to accommodate 100 pupils. Enrollment as of May 1995 stood at 119 pupils, increasing from 110 pupils in May 1994. Enrollment in 1990 was 89 pupils.

Air transportation services are operated out of the state-maintained Talkeetna Airport, the village airstrip, or at various lakes. The village airstrip is considered to be substandard by the Federal Aviation Administration. According to the Talkeetna Airport manager there were over 30,000 flight operations conducted at that field in 1994. The *Airport System Plan, Upper Cook Inlet*, prepared by the Alaska Department of Transportation and Public Facilities estimated that use of the Talkeetna airport could reach over 46,000 operations by the year 2000. The department is planning to upgrade the airport in a phased program of improvements.

TRAPPER CREEK COMMUNITY

Trapper Creek lies about 115 miles north of Anchorage near the intersection of the George Parks Highway and the Petersville Road. There is no clearly recognizable townsite; however, most businesses and residences are near the intersection or close to the George Parks Highway off the Petersville Road. Kroto Creek serves as a western community boundary and is also a common boundary with the Petersville/Peters Creek community to the northwest. Recreational activities, including hunting, snowmachining, and dog mushing, are the mainstay of the Trapper Creek visitor industry.

The Trapper Creek community began to take shape in the late 1950s with the arrival of early homesteaders anxious to take advantage of

Association, a volunteer organization.

agricultural land available. Though the majority of these homesteaders left soon after they arrived, a few remained to farm and raise families. In the late 1960s the George Parks Highway was built and stimulated in-migration to the area. With more people came expanded services and a sense of community.

Population

The 1990 census population for the Trapper Creek community was estimated at 296 persons in 110 households.

Economy

Today Trapper Creek has a limited economic base, with the majority of business categorized as retail and service. Many jobs are related to tourism (restaurants, gasoline stations, lodges, markets, etc.) or local and state government functions, such as schools, highways, and post office. Seasonal work is available in construction, commercial fishing, and mining. Since the town is so small and ill-defined the concept of a local economy is not especially applicable, especially with the preponderance of workers commuting between small communities and Anchorage and across small communities within a reasonable commute ring.

According to *Matanuska-Susitna Borough Community Profiles*, prepared by Matanuska-Susitna Resource Conservation and Development, Inc., in January 1995, Trapper Creek had a 1990 civilian labor force of 109 workers of which 76 were employed and 33 unemployed for an unemployment rate of 30.3% or roughly triple the rate for the Matanuska-Susitna Borough. Median family income for Trapper Creek residents in 1990, another measure of economic health, was \$31,071, compared to \$40,745 for the borough.

Housing

The 1990 census reported 203 housing units, of which 110 were occupied. Many vacant units are second homes or vacation cabins. The vacancy rate for owner-occupied housing was 4.4%. It was 11.5% for renter-occupied housing.

Public Services

The Trapper Creek Community Council is a five-member elected advisory council recognized by Matanuska-Susitna Borough as the representative body for the community in deliberations with the borough. The area represented by the council includes the built up area near the highway exchange and the area served by the Petersville Road extending to Kroto Creek. Only limited public services are provided in Trapper Creek.

Trapper Creek does not have an established fire service area. The closest fire station is about 15 miles to the south at the Sunshine Community Health Center Building on the George Parks Highway, which is one of two stations operated by the Talkeetna Fire Service Area. The other station is located at Talkeetna. A volunteer fire department did exist at Trapper Creek, but was disbanded several years ago. Anecdotal information suggests that there have been several cabin/home fires at Trapper Creek during recent years.

If a fire service area were to be established at Trapper Creek, it would likely be funded from local property taxes and possibly special assistance from federal, state, or private sources. Local tax levies for fire service areas in the Matanuska-Susitna Borough range from 1.0 mills at Meadow Lakes to 1.7 mills at Talkeetna.

EMS is provided by the Matanuska-Susitna Borough on an areawide basis with volunteer staffing. A single ambulance is located at Trapper Creek. Ambulances are also stationed at Willow, Sunshine Community Health Center, Talkeetna, and Valdez Creek.

Accident data provided by the Department of Transportation and Public Facilities for the Petersville Road covering a 20-month period (January 1994 through August 1995) indicate a total of 21 accidents of which 12 occurred on the paved portion of the road between mile 0 and mile 2.67; three occurred between mile 2.67 and mile 4.96; and five occurred between mile 4.96 and mile 18.6 (up to the Forks Roadhouse). None of the accidents were fatal, but 10 involved injuries. Two-thirds of the accidents took place during winter (October – April).

Accident data covering the same time period for the George Parks Highway from mile 63.32 near Willow to 167.73 near the northern boundary of Denali State Park were also reviewed. Total accidents for the period amounted to 442, of which 146 involved injuries including 17 fatalities. Sixty percent of the accidents occurred during winter. For the approximately 68-mile distance between the Talkeetna turnoff and the northern boundary of Denali State Park (which logically would be served by Trapper Creek EMS facilities) total accidents amounted to 272, of which slightly more than half occurred during winter months. Seventy-two of the accidents involved injuries, with 7 fatalities. As indicated by the data, more than half of accidents occurred on the roughly 36-mile stretch south of Talkeetna Junction.

Police services are provided by the Alaska State Troopers. A state trooper station, staffed by 2–3 troopers, is located at Sunshine (mile 97.5 on the George Parks Highway). It is anticipated that Alaska State Troopers would be able to keep pace with local needs within the context of statewide priorities.

The Trapper Creek Elementary School (K–6), which is operated by the Matanuska-Susitna Borough School District, is located just off the Petersville Road, 2 miles west of the highway interchange. Primary and secondary education services are provided on a borough-wide basis. The Matanuska-Susitna School District provides teachers and other operational resources to schools within the borough. The FY 1995–96

budget for the Trapper Creek Elementary School amounted to \$495,194. The school had

District level operational funding amounted to \$90.3 million, of which \$64.0 million or about 70% represented state distributions. Another \$4.8 million or 8% came from federal sources.

School construction is normally financed through the issuance of general obligation bonded debt. Total school construction bonds outstanding as of June 30, 1996 amounted to \$15.9 million. Debt reimbursement is available from the state on preapproved school projects subject to the limitations of the State Legislature. After 1994 the maximum debt service reimbursement provided (on a current year basis) by the state is 70% of the total. For FY 1996 the borough is eligible for about \$13 million in school debt reimbursement. One hundred percent of the eligible amount is expected to be received by the borough from the state.

Trapper Creek Elementary School experienced rapid enrollment growth during the past five years, rising from 29.5 FTE pupils in 1990 to 58.5 FTEs in 1995. Secondary school services (grades 7–12) are provided for students from the Trapper Creek area as well as from the Talkeetna area, and areas north of Willow to the Susitna River by the Susitna Valley Junior-Senior High School. The school is located on the George Parks Highway at mile 98.4, just south of the Talkeetna Spur road. The school also experienced rapid enrollment growth during the past five years, increasing from 119 FTEs in 1990 to 178 FTEs in 1995. Continued enrollment expansion at both schools could result in the need for additional facilities and operational resources. As noted, revenue allocations are made at the district level. There is no local area tax levy to support public education.

Trapper Creek has an established road service area with responsibility for 39.5 miles of roadway. The FY1996 levy amounted to 2.88 mills generating \$39,380 in estimated revenues. State revenue sharing funds added \$31,465 for a

14 certified and 6.75 classified full-time equivalent (FTE) employees.

total of \$70,845 estimated revenues. Estimated expenditures for the road service area amounted to \$54,711 for contractual costs and \$16,134 for administration, representing a cost of \$1,795 per mile. The Petersville Road is a state road and maintained accordingly.

PETERSVILLE AREA

This 200-square-mile area is located along the Petersville Road, beginning at about 12 miles from the intersection with the George Parks Highway. Kroto Creek forms its eastern boundary and it includes Petersville and Peters Creek. There is no community center per se, but residents are dispersed throughout the area. Gold discoveries were made in the upper tributaries of Peters Creek in the early 1900s leading to the development of a freighting trail that extended westerly to Peters Creek and led to the establishment of Petersville. Numerous mining operations were active in the area until being forced to shut down during W.W. II. Though a resurgence occurred in the late 1940s, nearly all mining activity ceased by the mid-1960s due to increased operating costs and the fixed gold price. With the price rising in the 1970s, many of the previously idle properties again were brought into production. Today mining is not a significant employer in the Petersville area, despite the likelihood of large gold reserves within the upper basin of Peters Creek.

Population

The population for the Petersville area was listed as 84 in the 1990 census, living in 37 households.

Economy

Tourism is becoming increasingly an important component of economic activity in the Petersville area. Recreational activities such as hunting, dog mushing, snowmachining, and cross-country skiing are stimulating development of small retailing and service businesses. According to the 1990 U.S. census, the Petersville area had employment of 14 workers. There were no unemployed workers indicated. Median household income amounted to \$13,977, compared to \$40,745 for the borough.

Housing

The 1990 census reported 317 housing units, of which 30 were occupied year-round. It is likely that most vacant units are for seasonal, recreational, or occasional use. The geographic boundaries for this area are quite large, including considerable sparsely populated lands. Also, the census planning area for housing exceeded that for the Matanuska-Susitna Borough's community area boundaries, increasing the housing counts.

Public Services

The Petersville area is represented by an advisory community council. The council has been inactive for several years. The Petersville Road is maintained by the state. Except for ambulance service, there are no other public services provided locally.

DENALI BOROUGH

The Denali Borough, which was incorporated in December 1990, includes 12,000 square miles of sparsely populated country. It is bounded on the south by the Matanuska-Susitna Borough. The majority of Denali National Park and Preserve (including all of the park's north side) is located within the Denali Borough. Most residents live along the George Parks Highway. According to the U.S. Department of Commerce, Bureau of Economic Analysis,

between Anderson on the north end and Cantwell on the south end. The Denali Borough contains four communities and a number of smaller settlements. The city of Anderson is the only incorporated community. The borough provides limited services to its communities, namely, planning, education, and administration. Cantwell (an affected community in regard to the alternatives considered in this environmental impact statement) is represented by a village council and receives funds from the borough in order to provide limited basic services (emergency medical and fire protection).

Population

The 1990 population in the Denali Borough was 1,764 persons. The borough's population was estimated at 1,923, as of July 1, 1994, by the U.S. census. The Alaska Department of Labor projects modest growth (between 1.2% and 2.5% per annum) in Denali Borough population through the year 2000.

According to Denali Borough's *Comprehensive Land Use Plan* (July 1995), the population in 1993 was 2,077 in 907 households, based on a special survey undertaken by the Denali Borough.

Housing

The number of housing units in the Denali Borough increased from 346 in 1980 to 706 in 1990. Of the 1990 total, 505 were occupied and 201 were vacant for an overall vacancy rate of 28%. The high vacancy figure reflects the high proportion of housing for seasonal, recreational, or occasional use in the borough. Rental housing is very limited in the area.

Economy

(Regional Economic Information System, Table CA25, May 1995), there were 1,309 full- and

part-time jobs in the Denali Borough in 1993. Major industry sectors with the largest employment shares included the following: services – 340 jobs; transportation and public utilities – 256 jobs; federal civilian – 149 jobs; military – 141 jobs; mining – 131 jobs; state and local government – 122 jobs; retail trade – 116 jobs; agricultural services, forestry, fishing, and other – 18 jobs; and, undisclosed – 36 jobs. Much employment was concentrated in trade, services, and government. Also notable were transportation and public utilities and mining industries. Growth in the visitor industry has contributed to recent job gains in these sectors. The Usibelli Coal Mine is the only operating coal mine in Alaska, currently employing about 110 people year-round. The Golden Valley Electric Association of Fairbanks operates a coal-fired plant near the mine, with about 30 employees. Tourism-related employment, including NPS personnel at Denali National Park and Preserve, is the largest source of employment in the borough. Clear Air Force Station is also a large employer with over 200 uniformed and civilian workers employed at the installation.

Employment is very seasonal within the Denali Borough, due to the tourist industry associated with Denali National Park and Preserve. The influx of tourists directly affects economic activity in the tourism-oriented businesses, such as gasoline stations, restaurants, campgrounds, lodges, etc. Most tourism-related businesses are closed from October through April. As a consequence of the wide swings in seasonal employment, unemployment rates vary considerably depending on the time of year (in February 1993 about 16.0% of the labor force was unemployed, whereas in July only 3.1% were unemployed). According to the Alaska Department of Labor, the annual average 1993 labor force amounted to 841 persons, of which 758 were employed and 83 were unemployed. Thus, the average unemployment level for the borough stood at 9.9%. The comparable statewide level was 7.8%.

Total personal income for the Denali Borough in 1993 amounted to \$41.2 million or \$22,062

per capita. The statewide and U.S. per capita figures for the same year were \$23,070 and \$20,800, respectively. Thus, per capita personal income for the Denali Borough was about 96% of the statewide per capita figure and 106% of the U.S. per capita figure.

Land Use

The Denali Borough is even more rural than the Matanuska-Susitna Borough, with much of its area within the boundaries of the national park and preserve. Most lands are undeveloped and primarily used for dispersed recreational and subsistence activities. Much of the area receives little or no use during the course of a year due to its remote location and high altitude environment. Limited residential and commercial uses are concentrated along the George Parks Highway, with an intensively developed area just outside the park entrance in the Nenana River Canyon that is used for seasonal lodging and related business and residential activity.

The Denali Borough recently adopted a comprehensive land use plan. The plan recognizes the need to consider land use actions, such as zoning and subdivision regulations. However, the borough has not yet passed any zoning and subdivision ordinances.

Ahtna, Inc. has expressed interest in having some of its lands in the northeast section of the Matanuska-Susitna Borough become part of the Denali Borough. According to Denali Borough's *Comprehensive Land Use Plan* (July 1995), Ahtna, Inc. officials believe that their corporation has more in common with the residents of Denali Borough than the Matanuska-Susitna Borough. In addition, the corporation intends on developing its lands and the current tax structure and land use actions in the Denali Borough are viewed more favorably than those in the Matanuska-Susitna Borough.

Public Services

The Denali Borough was incorporated in 1990 as a home-rule borough. The borough has a nine-person assembly and directly elected mayor. The assembly acts as the planning commission through its Land Use Planning Committee which includes representation from the assembly and members of the public. The Denali Borough provides only basic services on an areawide basis including primary and secondary education (by the Denali Borough School District), planning, and taxation. Special service areas and nonprofit community associations provide ambulance and fire protection services to most of the unincorporated communities.

The borough does not impose property or sales taxes; a 7% overnight accommodations tax and severance taxes are the major local revenue sources.

CANTWELL COMMUNITY

Cantwell lies in the Denali Borough just north of the Matanuska-Susitna/Denali Borough boundary on the Alaska Railroad line. The town center can be accessed year-round by a 2.5-mile paved spur road from the George Parks Highway. Summer travelers may also access the area via the Denali Highway, a 170-mile gravel road between Cantwell and Paxson to the east.

Cantwell began as a construction camp for the Alaska Railroad in the early 1900s and persisted as a supply and transportation center serving nearby mining camps.

Population

Cantwell and the other nearby highway communities of McKinley Village and Healy have grown at “boomtown” rates over the past decade. The population increased from 89 persons in 1980 to 147 person in 1990, or 65%. The 1993 borough census placed the population at 184 persons. Student enrollment (K–12) at the Cantwell school in 1993 stood at 25 pupils.

Economy

The Cantwell economy involves service and maintenance to both the Alaska Railroad and the George Parks and Denali Highways. There are also some local mining activities, construction, and food, fuel, and overnight lodging services for travelers on the George Parks Highway.

A lodge (including bar, laundry, and camping facilities), construction equipment company, bunkhouse, fishing/hunting guide service company, an airstrip, and an Alaska Railroad repair facility are located in the Cantwell settlement. At the George Parks Highway interchange there is an RV park, gift shop, restaurant, gas station, junkyard, two lodging facilities, Cantwell school and fire station, and state troopers’ office.

A 1993 borough survey indicated that 55.9% of Cantwell respondents were opposed to the borough encouraging tourism development in the immediate area. A similar percentage were in favor of land use actions in certain circumstances. It should be noted that the survey yielded 34 responses from a total of 121 mailed survey instruments for a relatively low response rate of 28.1%.

Housing

In 1990 there were 85 housing units, of which 62 were occupied and 23 vacant. Five of the vacant units were for seasonal, recreational, or occasional use. The median value of owner-occupied housing (42 units) was \$53,800. Median contract rent for rental housing (20 units) was \$139 in 1990.

Public Services

Volunteer fire and ambulance services and facilities are located at the George Parks Highway interchange. The Cantwell school, which is operated by the Denali School District, is also located near the highway interchange.

DENALI STATE PARK

Denali State Park (325,460 acres) is about 140 miles north of Anchorage along the George Parks Highway adjacent to Denali National Park and Preserve. A variety of visitor facilities are available, including four campgrounds with a total of 114 campsites, picnic areas, a boat launch on Byers Lake, and several scenic pullouts along the highway. About 48 trail miles (some maintained) provide hiking routes.

There are about 1,000 acres of private land within the Denali State Park boundaries. These include private inholdings and native allotments. There are no active mining claims in the state park. Most of the private land is near the southern park boundary.

Five management zone classifications have been identified in the 1989 *Denali State Park Master Plan*: wilderness, natural, natural with special management considerations, cultural, and recreation development. Of these, the recreation development zone allows the highest level of development. For example, if a visitor center was to be located in Denali State Park, it would be built in one of the recreation development zones. The five zone classifications cover only state-owned land; all private land within the park is zoned as part of the Denali Special Land Use District of the Matanuska-Susitna Borough. Zoning regulations in this district are stricter than those applied to private land outside the park and include setbacks, vegetative buffer requirements, and a 5-acre minimum lot size.

According to the master plan, the three blocks of nonpark land in the area that probably have the greatest potential impact or influence on the park are: the private lands that extend into the south end of the park about 5 miles along the George Parks Highway corridor; the Alaska Railroad's 4,000 acres near Hurricane, which extends about 6 miles north of the park along the highway/railroad corridor; and the large holdings of the Matanuska-Susitna Borough, which extend south from the park to Trapper Creek along the George Parks Highway.

MINING AND INHOLDINGS

On the south side within the boundaries of the Denali National Park and Preserve there are about 16,600 acres of inholdings, including patented mining claims, unpatented lode claims, unpatented placer claims, and unpatented Alaska Native applications. By far the greatest amount of acreage — 12,700 acres — is in unpatented Alaska Native applications. These inholdings are located primarily in the Cantwell/Dunkle Mine area, although some are located along the southwestern edge of the Tokositna Glacier and a small tract is on the Ruth Glacier.

As of January 1996, there were 203 state mining claims on state-selected and state-patented lands from the Forks Roadhouse to the Denali State Park boundary in the upper Peters Creek drainage, which is in the Yentna Mining District. This area has seen continuous, mostly small-scale mining activity since the discovery of gold on Dollar Creek in the early 1900s. There are numerous claim conflicts that involve over staking by multiple claim owners in the Peters Creek drainage and its tributaries. Three federal mineral surveys composed of 123 federal mining claims located in the upper Peters Creek drainage have been declared abandoned by the Bureau of Land Management, and a state land selection has attached to these federal lands. There are numerous mining claims filed on state selections along the Petersville Road that would become valid upon land conveyance from the federal government. State land management plans and policies would support the maintenance of mining activities and would provide direction on measures to avoid conflicts with other land uses. The state is also considering partial use of this area for recreational mining (e.g., small-scale private gold panning).

The Alaska Division of Mining and Water Management identified two areas within the

federal mineral surveys for recreational mining and has closed them to mineral entry. The remaining portions of the mineral surveys will boundaries.

There are four federal mining claims near the end of the Petersville Road within Denali State Park. The legal descriptions for these claims are in the NW1/4, Section 22, T29N, R8W, as identified on the Landownership – Petersville Road Area map.

VISITOR USE IN THE STATE AND NATIONAL PARKS

Based on raw data visitor counts provided by the state Division of Parks and Outdoor Recreation, visitation to Denali State Park increased from 399,607 in fiscal year 1990 to 474,699 in fiscal year 1995 for an average annual growth rate of 3.5%. It should be noted, however, that the Division of Parks and Outdoor Recreation considers the reliability of state park visitation data to be questionable except for purposes of providing rough orders of magnitude in regard to visitation levels as well as past trends. Of the 1995 visitation indicated, about 30% was comprised of non-Alaska residents. Peak month visitation occurred in July in almost all units in the park. The percent of total annual visits during the peak month ranged from 22.6% in the Denali Viewpoint South unit to 50.0% at the Chulitna River bridge unit in 1995. The Alaska Veterans Memorial had peak visitation during the month of May (because of Memorial Day ceremonies). Normally, peak visitation at this site occurs in July. Visitation at Byers Lake amounted to 12,185 in 1995, of which two-thirds were non-Alaska residents.

The main entrance to Denali National Park and Preserve is located on the George Parks Highway about 240 miles north of Anchorage and 120 miles south of Fairbanks. Visitation at Denali National Park and Preserve has grown dramatically since 1972 when the George Parks Highway was completed between Anchorage and Fairbanks and visitors could easily reach

be open to mineral location and have state-selected mining claims located within the survey the park by private car instead of taking the train. The park currently has the largest visitation of any of the Alaska national parks. In 1995, Denali National Park and Preserve recreation visits totaled 544,209 according to NPS public use records, as shown in table 9. This level of visitation represents a decline of about 8% from the peak figure of 592,431 registered in 1988, which ended a 15-year growth phase in visitation.

The data also reveal that overnight stays in the park were essentially unchanged between 1985 and 1995, with a downturn occurring in 1989 and modest growth after 1990. Increases occurred in all categories (concession lodging, campgrounds, backcountry, etc.), except the concession hotel which remained stable at about 24,500 overnight visits.

The majority of visitors enter the area by way of the George Parks Highway and to a lesser extent the Alaska Railroad (AKRR), although the share represented by the latter has increased substantially during recent years. Total rail passenger arrivals increased from about 86,000 in 1989 to 133,000 in 1995, or an increase of 55%. Most rail passenger arrivals are associated with package tours (both Princess Tours and Westours accounted for 110, 500 arrivals in 1995). Recall from the discussion on park visitation that the number of visits to the park during this period remained constant. A small percent of visitors travel by small aircraft to the McKinley Park airstrip inside the park or to private airstrips outside the park. Passenger arrivals to Denali National Park and Preserve by travel mode in 1995 were derived from NPS sources (NPS 1996e). The arrival numbers for the railroad travel mode have been updated using AKRR data obtained in June 1996. They are as follows:

Transportation Mode	Visitors
Automobile	373,569
Railroad	132,968

AFFECTED ENVIRONMENT

Bus (estimated)	28,832
Air	5,053

Traffic on the George Parks Highway fluctuates greatly throughout the year and also varies in

TABLE 9: DENALI NATIONAL PARK AND PRESERVE RECREATION VISITATION (1985–1995)

Year	Recreation Visits	Pent. Change	Overnight Stays				
			Concess. Lodging	NPS Campgrounds	NPS Group Campgrnd.	NPS Back-country	Total Overnight stays
1985	436,545	-	28,020	67,963	3,001	26,029	125,013
1986	529,749	21.4%	29,752	67,071	2,693	27,999	127,515
1987	575,013	8.5%	23,780	65,649	2,086	28,962	120,477
1988	592,431	3.0%	22,101	77,500	1,191	29,460	130,252
1989	543,640	-8.2%	23,429	63,789	1,637	34,113	122,968
1990	546,693	0.6%	24,459	56,329	1,534	35,918	118,240
1991	558,870	2.2%	24,311	62,539	2,683	29,798	119,331
1992	503,674	-9.9%	27,452	73,066	2,831	38,262	114,159
1993	505,565	0.4%	25,683	63,957	2,034	33,010	124,684
1994	490,311	-3.0%	23,942	63,082	2,592	41,455	131,071
1995	544,209	11.0%	24,459	65,105	1,807	39,500	130,871
AARG*							
1985-95	2.2%	n/a	-1.3%	-0.4%	-4.9%	4.3%	0.4%
1990-95	-0.1%	n/a	-0.0%	2.9%	3.3%	1.9%	2.1%

* Annual average (compounded) rate of growth.

n/a - not applicable.

SOURCE: National Park Service, Monthly Public Use Reports. a recreation visit is defined as entries of persons onto lands or waters administered by the NPS for recreational purposes excluding government personnel, through traffic (commuters), trades-people, and persons residing in the park boundaries. Same day reentries, negligible transits, and entries to detached portions of the same park are considered a single visit.

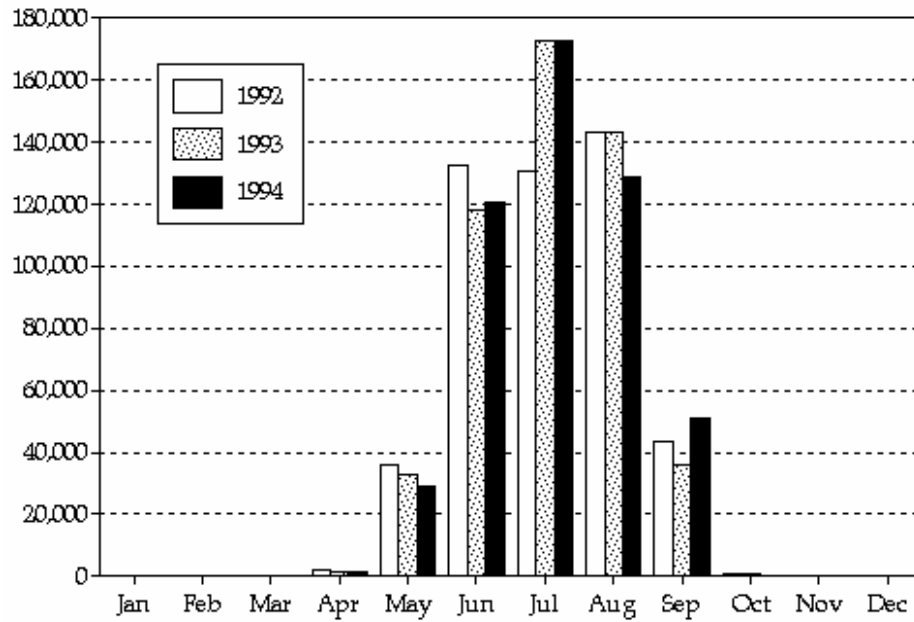
different places along the road. Recent Alaska Department of Transportation and Public Facilities data on average daily traffic (ADT) in both directions was obtained for the George Parks Highway at crossings and intersections near the Petersville Road and Talkeetna. In 1995 the ADT on the George Parks Highway at Trapper Creek at or near the junction with the Petersville Road was counted at 1,285 vehicles per day, increasing from 1,000 vehicles in 1993 and from 1,020 in 1990. For Talkeetna Junction the 1995 ADT figure was 1,500, increasing from 1,300 in 1993, but decreasing from 1,800 in 1990. For Talkeetna Road near the town of Talkeetna, the figure was 1,252, compared to 1,000 in 1993 and 840 in 1990. At Byers Lake, ADT on the George Parks Highway was at 1,200 in 1995, 980 in 1993, and 821 in 1990. Note, however, that these figures refer to year-

round traffic flows. If traffic flows were considered during the summer months only, the ADT during these months could be about two times as high.

Most visits to Denali National Park and Preserve occur during June, July, and August. Virtually all use is on the north side of the park along the 88.5-mile park road corridor between the George Parks Highway and Wonder Lake. Monthly recreation visits for the years 1992 through 1994 are shown graphically below. The peak month occurred in July for both 1992 and 1993, with about 34% of the annual total, whereas it was in August in 1994 with 29% of total annual visitors. The 1995 peak (not shown) also fell in August with 31% of the annual total. Park use figures do not distinguish between non-Alaska and Alaska residents.

AFFECTED ENVIRONMENT

An often-cited reason for the relatively slow growth, indeed in some years decline, in visitation to Denali National Park and Preserve is the



Source: National Park Service, Monthly Public Use Reports

Denali National Park and Preserve Recreation Visits by Month (1992-1994)

seasonal limits placed on the number of vehicles that can travel on the park road beyond Savage River. The 1986 *General Management Plan* established an annual seasonal traffic limit of

10,512 vehicles for the park road beyond the Savage River, and this limit is still in effect.

Tour and shuttle bus	5,094
Private vehicles	3,664

NPS vehicles 1,754

In 1994, the subset 5,094 limit for tour and shuttle buses was adjusted to 2,089 tour buses and 3,394 vehicle transportation system (VTS) buses (NPS 1996e). Increased use of the park road has resulted in total traffic exceeding the seasonal limit of 10,512 vehicles by a small amount (40 vehicles in 1995). Only one of the tours, the long tour, called the tundra wildlife tour, is counted toward the GMP seasonal limit. The short tour or Denali natural history tour is not counted.

Total 1995 passengers carried on the visitor transportation system and long tour amounted to 87,722 persons and 109,448 persons, respectively. The allocation seasonal total (i.e., passengers carried between May 26 and September 13) were the same for the visitor transportation system and somewhat lower at The seasonal limit on private vehicles includes commercial and personal vehicles traveling to Kantishna. Professional photographers allowed to drive the park road beyond Salvage River are also capped.

No limits have been established for road use during the shoulder season (May 15–25 and September 14 until road closure). During the period May 15–25, private vehicles and tour buses are permitted to drive as far as the Teklanika rest stop, pending weather and road conditions. In September, after the visitor transportation system ceases operation, a lottery system is instituted that limits the number of private vehicles allowed on the park road. During the second weekend after Labor Day (Friday – Monday), up to 1,600 lottery winners (400/day) are permitted to drive their vehicles as far as Kantishna. Actual use in 1995 exceeded 300 on only one of the four days, reaching 308 vehicles (NPS 1996e).

Although there is no restriction on vehicular use of the paved portion of the road (from the George Parks Highway to Savage River), NPS traffic statistics indicate that use is increasing steadily from spring through fall with as many as 500 vehicles per day during the peak season.

102,640 for the long tour. With a maximum of 2,089 trips per season and 52 persons per bus, total capacity for the long tour amounts to 108,628 from May 26 through September 13. Clearly the long tour is effectively operating at capacity. Short tour passenger counts amounted to 48,270 passengers overall and 44,025 during the allocation season. The figures for the visitor transportation system were down slightly (about 1,800 fewer passengers) from the previous year. The long and short tour totals were higher by about 3,000 passengers each, compared to 1994. The visitor transportation system operates under a schedule determined by the National Park Service with a maximum seasonal capacity of 3,394 bus trips. With an average of 30 passengers per bus, the visitor transportation system estimated capacity is about 101,820 passengers. Thus, in 1995 capacity use for the visitor transportation system was about 86% (NPS 1996e).

An NPS study of so-called turnarounds was conducted in 1995. This was done by questioning vehicle drivers at the Salvage River check station (located at the end of the paved section of the park road). A total of 3,700 vehicles (and occupants) participated in the study. Only 5% of persons interviewed indicated that they were upset or disappointed because of the limitation on vehicular access beyond that point (NPS 1996e).

It is possible that the seasonal limits have induced other tourism-oriented activities in the immediate area. These include flightseeing, rafting, horseback riding, a driving range (and a possible future development of a golf course).

In summary, the data on VTS, long tour, and private vehicular use of the park road support the conclusion that visitor use of park facilities is generally at the maximum available under current conditions and given the constraints on vehicle access during the core season. This condition has persisted for several years. Anecdotal evidence suggests that Alaska residents and independent nonresident visitors are less likely to make travel and lodging arrangements in advance, compared to package tour operations and, thus, may feel adversely

affected by the imposed limitations. Nonetheless, future growth in visitation by package tour and in-package visitors is also likely impeded due to the limitations on capacity. It should be noted, however, that the National Park Service is working on a development concept plan for the entrance area and road corridor that should increase the activities available in the entrance area and boost the capacity for visitor use on the road somewhat (NPS 1996f).

Visitor use, specifically on the south side of the Alaska Range within Denali Park and Preserve, is difficult to estimate since there are multiple points of access. Backcountry use permits are not required for this area of the park except for climbers on Mount McKinley. As noted previously, there were 1,277 attempts to scale the mountain and about 125 climbs on other peaks in the park in 1994. There were 998 There is extensive use of the south side in winter for recreational snowmachine use, primarily by Alaska residents from Anchorage and to a lesser degree from Fairbanks and other year-round residents along the George Parks Highway. Major areas of activity are the area near the plowed end of the Petersville Road (at Kroto Creek). Most of this use is on state lands north of the trailhead and in the Dutch Hills and Peters Hills, although some use extends into the national park north of the Dutch Hills. Users often park on the shoulder of the Petersville Road during the snowmachine season, causing unsafe conditions and hampering snow-removal. Establishment of a proposed parking area by the Matanuska-Susitna Borough near the Forks Roadhouse would eliminate most, but not all, of the parking problems. Another major area of snowmachine use is in the Broad Pass area. Users park in pullouts along the George Parks Highway and explore lands to the north and south, including lands in the national park near Cantwell Creek and the Dunkle Hills.

Currently snow machines are allowed throughout Denali State Park once snow depths are sufficient to protect underlying vegetation. State Parks intends to initiate a management planning project, along with the state Division

attempts to scale Mount McKinley in 1990. Several companies operating under concession permits provide mountaineering guide services on Mount McKinley. In 1990 they guided some 232 clients on the mountain for average trips of 20.7 days. Foot access to park lands, although possible, is extremely limited and difficult because of the distance from roads to the park boundary. Private aircraft operate along the south side on scenic flights, mostly out of Talkeetna, but relatively few private aircraft land in the park because of weather, topography, and glacial/snow conditions. The primary access for the visitors to the south side is by way of commercial air taxi and flightseeing aircraft. In 1990 about 15,000 people visited the south side of Denali by commercial aircraft (10,200 flightseers, mostly from Talkeetna), of which about 5,000 landed in the park.

of Land, and possibly the Matanuska-Susitna Borough and the National Park Service, to identify and map snowmachine trails and corridors in the area north of the Petersville Road, propose new access facilities, such as trailheads and parking areas, and arrange for trail maintenance. The maintenance issue has several components: levels of volunteerism, amount of equipment needed, signing requirements, and mapping.

ATVs are prohibited in the state park, except by special permit. In the Tokositna area, the Division of Parks and Recreation provides permits to the people who have the (four) mining claims at the head waters of Long Creek.

Dogsledding is another winter activity on the south side of Denali, although there appear to be no specific sledding trails in the area. This activity primarily occurs in Denali State Park and on other public lands north and south of the Petersville Road, with very little in the national park. In the Tokositna area, sledders often use snowmachine trails. One individual previously offered dogsled rides within the area. Some conflicts between dogsledders and other trail users have occurred and are increasing.

Most south side visitors in the summer use commercial operators both for access to the national park and to guide them once there. Relatively few visitors experience this rugged area without a guide. Thirty-eight companies were known to have provided commercial visitor service to the south side between 1988 and 1990. Twelve types of guided services were provided in 1990. These included mountaineering, winter backcountry (cross-country skiing, snowshoeing, and winter camping), dog mushing, backpacking, river trips, sport fishing, guided hiking, air taxi, and flightseeing. The Talkeetna area is the primary base for companies that provide these commercial services.

Commercial services on the south side are provided for flightseers, mountaineers, However, both the state and the National Park Service have regulatory authority over aircraft *landings* within their respective management boundaries. In September 1996, the Alaska Division of Parks and Outdoor Recreation adopted new aircraft regulations for Denali State Park. Fixed-wing landings would be prohibited east of the George Parks Highway, except on Blair and Ermine Lakes; practice landings would be prohibited throughout the park; and helicopter landings would be allowed only by commercial use permit and only at five locations: Eldridge Knob; Quill Hill; the gravel bar located at the base of the Eldridge Glacier; the gravel bar located at the confluence of the Fountain and Chulitna Rivers; and the gravel bar located at the base of the Ruth Glacier.

The next highest commercial use is for recreation in the Ruth Glacier area. In 1990 scenic landings, guided hikes, backpacking, dog mushing, skiing, and climbing accounted for nearly 3,700 visitor-days in this area. Most of these were short, one-day visits; however, some 272 people were guided in the area on trips that averaged 5.7 days.

Other general guided backcountry use accounted for about 3,500 visitor-days of which two-thirds

recreation visitors to Ruth Glacier/Great Gorge/Sheldon amphitheater, hunters, and general backcountry users.

Flightseeing activities account for the majority of visits, 10,200 people took such flights in 1990. Most did not land on park land. The majority of flightseers used services departing from Talkeetna, but a dozen or more Anchorage aviation companies also provide the service. Neither the National Park Service nor state agencies have control over helicopter and other aircraft *flights* within the airspace over the state and national parks. The Federal Aviation Administration has complete regulatory authority over airspace classification and use within the territorial limits of the U.S.

were short trips. However, 170 people were guided on longer trips, averaging 7.6 days. Guided hiking and backcountry trips tend to be longer in south side of Denali compared to the north side of Denali, where such trips are only about 2.5 days on average. Visitor-day figures do not include guides or pilots. Nonetheless, the number of such people is significant because the ratio of guides to visitors is commonly about 1:3.

The new Princess Tours hotel within the boundaries of Denali State Park (located at mile 133 of the George Parks Highway), which is expected to open in 1997, will likely stimulate demand for additional visitor access to Denali National Park and Preserve and Denali State Park. Package hotel guests at the new hotel would be provided the opportunity to visit the north side of the national park via the existing national park entrance as part of their package tour. The hotel will accommodate about 320 persons.

ENVIRONMENTAL CONSEQUENCES

IMPACTS OF THE PROPOSED ACTION

The following impact analysis for the proposed action assumes that sufficient land use controls would be implemented and in-place prior to major development. For example, scenic buffers would be established along the Petersville Road to protect the viewshed and the Matanuska-Susitna Borough would manage its lands along the George Parks Highway and Petersville Road corridors to protect resource values associated with the proposed development and to maintain and enhance the scenic driving experience. The state, National Park Service, boroughs and other jurisdictions, as appropriate, would also work together to manage recreational activities (e.g., aircraft, snowmachines, boats, ATVs, skis, and dogsleds) and other uses of public lands on the south side with the intention of keeping impacts within acceptable levels. For additional information on these land use controls and actions see the “Elements Common to All Action Alternatives” section.

Based on current understanding of visitor uses and trends, the need for visitor facilities and services is more apparent for the central development zone of Denali State Park than for Talkeetna or Broad Pass. That is why a description of facilities and services and an accompanying impact analysis are provided in this DCP/EIS for the central development zone location and not for the other locations. All locations are mentioned in the description of the proposed action for possible future facilities and services once need and opportunity are established. This provides reasonable flexibility in this plan to address potential future needs.

Any future facilities in these locations would require consultation and coordination (and additional environmental impact analysis) in partnership with local communities and others to firmly establish need and opportunity and to define appropriate actions.

VEGETATION

Analysis

The land cover classification that was developed for the south side includes eight vegetation classes (see the “Affected Environment” chapter). Using a geographic information system (GIS), land cover classes were plotted on clear film and overlaid on topographic maps depicting potential development areas. Development areas were also examined in the field.

The estimates required for facility developments, measured in acreage of disturbance, were determined independently. Assumptions used to calculate these acreages were as follows:

Visitor centers would be one story (one story is used to calculate a maximum disturbance area). Thus the disturbance from the structure’s footprint would be equal to the entire square footage of the structure (e.g., up to 5,000 square feet) divided by 43,560 square feet per acre. Onsite utilities (electricity, water, sewer) would disturb ½ to 2 acres of vegetation, depending on the size of the visitor center. An additional 1½ to 2 acres of disturbance would be created indirectly by construction.

Parking lots would require relatively little grading. Given this assumption, it is estimated that 740 square feet for every two cars and associated shared driving lane would be disturbed, and 1,695 square feet would be disturbed for each recreational vehicle or bus and its associated driving lane. Parking for the Tokositna visitor center would be sized to allow 45 cars and 30 buses or RVs. Parking for the central development zone visitor center in the proposed action would be sized to allow 25 cars and 15 buses or RVs.

Upgrade and extension of the Petersville Road from mile 19 at the Forks Roadhouse to the proposed Tokositna visitor center site at about mile 41 would disturb from 100 to 140 acres of vegetation. This range includes the vegetation lost from a bicycle/pedestrian pathway constructed as part of the road shoulder or separate from the road.

Construction of an access road to the visitor center along the George Parks Highway would disturb an estimated 48 square feet of vegetation per linear foot of road. For this DCP/EIS it is assumed that the access road would be up to 2,000 linear feet long.

Public use cabins would disturb a maximum of 10,000 square feet each, including indirect impacts from construction.

A helicopter pad for emergency use at the Tokositna site would disturb about 2,000 square feet of vegetation.

The picnic facility at Tokositna would disturb about 3,000 square feet of vegetation.

Trails would impact an estimated 4 square feet of vegetation. The number of acres and types of vegetation disturbed or lost for construction of the trails cannot be determined until specific locations are identified. However, for this impact analysis, it is assumed that up to 5 miles of trails would be developed both in the Tokositna and Chelatna Lake area, and up to 3 miles of trail would be developed in the central development zone of Denali State Park.

Construction of a trailhead along the Dunkle Hills road would result in the loss of about ½ acre of vegetation.

Table 10 displays the amount and type of vegetation lost or disturbed directly by the proposed actions.

TABLE 10: VEGETATION LOST/DISTURBED DIRECTLY BY THE PROPOSED ACTION

PROPOSED FACILITIES	VEGETATION LOST/DISTURBED (ACRES)
Tokositna Area <ul style="list-style-type: none"> · Visitor center and associated utilities, helicopter pad, and picnic area · Visitor center parking · Petersville Road extension and upgrade · Primitive RV and tent campsites · Public use cabins · Trails · Employee housing 	3 acres grass, low shrub, and tall shrub 2 acres grass, low shrub, and tall shrub 100–140 acres grass, low shrub, and tall shrub 12 acres grass, low shrub, and tall shrub 1 acre grass or tall shrub 3 acres tundra, low shrub, and high shrub ½ acre (vegetation type dependent on location)
Chelatna Lake <ul style="list-style-type: none"> · Campsites · Public use cabins · Trails 	1 acre tall shrub and low shrub 1 acre tall shrub and low shrub 3 acres tundra, low shrub, and high shrub
Central Development Zone <ul style="list-style-type: none"> · Visitor center and associated utilities and access road (assume 2,000 linear feet) · Visitor center parking · Vista clearing · Campground · Trails 	3 acres mixed and deciduous forest 3 acres mixed and deciduous forest 1–30 acres (vegetation type dependent on location) 7–12 acres mixed and deciduous forest 2 acres mixed and deciduous forest
Dunkle Hills Trailhead	½ acre tundra
TOTAL	143--217 acres vegetation

Brushing and vista clearing along the George Parks Highway would create an unknown amount of vegetative disturbance or loss, as would unofficial user-created trails and campsites that may develop off the planned trails and near cabins.

Little if any vegetation would be disturbed or removed to establish the exhibits along the highway. All roadside exhibits along the George Parks Highway would be developed in areas already disturbed during highway construction and maintenance. Such sites are numerous, widespread, and many are still without vegetation, although some have revegetated with Sitka alder.

Considering that the vegetation classes extend over several million acres in the planning area, and the commitment to avoid, wherever possible, construction in sensitive areas like wetlands, loss of this estimated acreage is not considered a significant impact on vegetation.

Additionally, the proposed facilities could lead to increased development of other lands on the south side (private, borough, state), or “spin-off” development.⁴ However, land use controls would be implemented that would minimize the amount of vegetation lost from this development. For example, establishing scenic buffers would reduce the amount of vegetation removed and lost due to development directly adjacent to roads. If such land use controls were not implemented, however, then vegetation loss could be greater because the extent to which spin-off development could occur would be unrestricted.

The proposed facilities, particularly extension of the Petersville Road, would facilitate

4. Spin-off development is defined for the purposes of this analysis as gas stations, hotels, general stores, etc. that are built in response to construction of proposed facilities. It is assumed that spin-off development would be concentrated along the George Parks Highway and the first 19 miles of the Petersville Road where all of the private land is located.

snowmachine and ATV access to the south side somewhat. Facilitated access would result in some plants being injured or destroyed either directly by these vehicles (e.g., abrasion or other injuries) or indirectly because of vehicle emissions. Pollutants emitted by regular road traffic would increase as well under this alternative, also adversely impacting plants (see “Impacts on Air Quality” section).

All facilities would be sited to avoid wetlands, or if that is not practical, to otherwise comply with Executive Order 11990 (“Protection of Wetlands”), as indicated in appendix C.

Conclusion

An estimated 143 to 217 acres of vegetation would be lost or disturbed by construction of the proposed developments. Increased development and use on the south side would also cause an additional unknown amount of vegetation disturbance or loss through brushing and vista clearing, the development of user-made trails and informal campsites, and due to increased ORV use and spin-off development of other lands. Considering that the vegetation classes extend over several million acres in the planning area, and the commitment to avoid, wherever possible, construction in sensitive areas like wetlands, the loss of this acreage is not considered a significant impact on vegetation.

GRIZZLY AND BLACK BEARS

Analysis

Black bears are generally less sensitive to human disturbance than grizzly bears; they are also less likely to confront or injure backcountry users as they are typically less aggressive (Mattson 1990). Where grizzly bear and black bear ranges overlap, efforts to protect each species and prevent habituation and confrontations are similar but more intensive for grizzly bears. Therefore, this analysis concentrates on the effects on grizzly bears, and

where their ranges overlap, conclusions are applicable to black bears as well.

This analysis further assumes that several mitigating measures, including research and monitoring of the bear populations on the south side, would be taken to ensure none of the proposed actions would have major adverse effects on bear populations and habitat (see the “Mitigating Measures Common to All Action Alternatives” section).

The analysis that follows discusses both direct and indirect impacts. Direct impacts are defined as those that are caused by the action and occur at the same time and place as the action (e.g., loss of habitat from construction of facilities). Indirect impacts are caused by the action, but are later in time or farther removed in distance (e.g., displacement of bears from habitat, human-bear confrontations, and bear mortality and harassment).

Potential indirect impacts are described in detail below. It is assumed, based on experience in other national and state park units, that indirect impacts would occur primarily where human activity is most concentrated — near developed areas, roads, and trails. Indirect effects also would likely occur in areas where use is more dispersed but still relatively high (i.e., within a radius of a 1–2 miles out from developed areas). Although the proposed action would create new developed and dispersed use areas, it is not expected that resulting indirect impacts would significantly affect regional bear populations on the south side because a large portion of the south side would remain relatively free of human development and use.

Habitat Loss and Bear Displacement. Under the proposed action from 127 to 167 acres of prime grizzly habitat would be lost directly due to construction of the proposed facilities in the Tokositna, Chelatna Lake, and Dunkle Hills areas, including the upgrade and extension of the Petersville Road into the state park (see table 11). From 16–50 acres of general grizzly habitat would be lost from construction of facilities in the central development zone of the state park. No habitat loss would be expected

from other proposed actions. Due to the widespread availability of both prime and general grizzly habitat (there are at least a half-million acres of each in the study area), the loss of this amount of acreage is not expected to substantially impact grizzly populations.

As noted, black bear habitat overlaps considerably with grizzly habitat (see the “Affected Environment” chapter); therefore, the entire 143 to 217 acres of lost grizzly habitat would also be considered a loss of general black bear habitat. Again, the loss of this amount of habitat would not substantially impact black bear populations because of the abundance of general habitat throughout the south side.

Bears may also be displaced from habitat by the proposed actions. Increased noise and human presence associated with the initial stages of facility development (e.g., surveying and construction) and continuing through the life of the development likely would disturb bears and cause some to abandon habitat in the vicinity of these developments. Research in Yellowstone National Park indicates that grizzly bears will avoid areas of more intensive human use such as recreational roads, campsites, and frontcountry developed sites (Mattson 1990). Though no formal research on displacement effects has been conducted on Denali National Park and Preserve's north side, bears appear to avoid use of the developed areas near the park entrance except for transit purposes (NPS 1995d). Based on this information, it is expected that the proposed developments and the associated increase in year-round human use of these areas would displace some bears from these areas.

There is less research that relates to backcountry use and lightly used trail corridors or developed areas, although there is some evidence that even small amounts of human use in an area will result in some temporary grizzly bear displacement. For example, researchers have noted that when areas of Yellowstone National Park are periodically closed to human use, there

is a subsequent increase in the densities of bears in those areas. It has also been shown that bears will forego using high quality habitat in favor of being closer to escape cover when humans are present. One characteristic unique to the grizzly bears on the south side is that, unlike grizzly bears that have been studied in the lower 48 states or on the north side of Denali National Park and Preserve, many south side bears may have only rarely encountered humans. As a result, their initial reactions to increased human presence may be more unpredictable than the reactions of bears that have grown accustomed to human use.

nearby (Interagency Grizzly Bear Council 1987b).

As noted in the impact analysis for vegetation, the proposed facilities could lead to increased strip development of other lands on the south side. However, land use controls would be in place to guide development, minimizing the amount of bear habitat lost either directly or indirectly as a result of such development.

TABLE 11: ACRES OF GRIZZLY BEAR HABITAT LOST UNDER PROPOSED ACTION

Proposed Facilities	Estimated Acres of Prime Grizzly Habitat Lost*	Estimated Acres of General Grizzly Habitat Lost*
Tokositna Area		
·Visitor center and associated utilities, helicopter pad, picnic area, and parking	5	–
·Petersville Road extension and upgrade	100–140	–
·Campground	12	–
·Public use cabins	1	–
·Trails	3	–
·Employee housing	½	–
Chelatna Lake		
·Campsites	1	–
·Public use cabins	1	–
·Trails	3	–
Central Development Zone		
·Visitor center and associated utilities, parking, and access road	–	6
·Vista clearing	–	1–30
·Campground	–	7–12
·Trails	–	2
Dunkle Hills Trailhead	½	–
TOTAL ACRES LOST	127–167	16–50

*Prime grizzly habitat is defined as tundra, grass, tall, and short shrub vegetation where food sources (berries, spawning salmon, moose calves) are abundant and there are potentially large numbers of bears. General grizzly habitat is defined as mixed or deciduous forest where bear use is more dispersed, although food sources may still be plentiful.

Confrontations and Human Injury. Bear attacks on humans usually occur when people encounter a bear suddenly or are in the vicinity of bears that have become habituated to people’s food or garbage (Herrero 1985). Even

with relatively low recreational use levels, several conflicts between bears and humans have occurred on the south side in the past few years, including attacks, bluff-charges, and situations involving bears “lingering” around

backpackers' camps and campgrounds trying to get human food or garbage. Since it is not mandatory to report such interactions, complete records on the number of past human/bear conflicts on the south side are not available; however, four incidents involving black bears and three involving grizzlies have been reported since 1980. The situations involving black bears occurred near the Tokositna Glacier (1980 and 1993), Byers Lake campground (1990), and Chelatna Lake (1991). The three grizzly interactions took place near Chelatna Lake (1986), near Byers Creek between the George Parks Highway and the Chulitna River (1992), and in Byers Lake campground (1993) (NPS 1995c; ADNR 1995). In the future, the proposed facilities and the associated increased recreational use of the south side would result in a greater potential for bear/human interactions.

There are three primary factors that researchers indicate might affect the likelihood of bear/human confrontations: habitat/terrain, season of the year, and the degree of habituation of bears to human food.

Habitat/Terrain — Where both humans and grizzlies have major attractants, there is the potential for conflict (NPS 1992b). Proposed development sites would attract visitors because of the interpretive and recreational opportunities provided, while these same sites, especially those in the Tokositna and Chelatna Lake areas, would continue to attract grizzlies because of the availability of food such as winter-killed moose, moose calves, berries, and salmon. Though some bears would be displaced from these areas by facility siting and the presence of humans, other bears would not be so deterred and conflicts between humans and bears could occur.

Bear/human confrontations often occur when human activities take place in habitat with heavy brush or short sight distances because of terrain, or when humans compete with bears for the same resources (e.g., fishing). Walkways or hiking trails through dense, brushy vegetation, such as alder, would likely be used by bears as well as people due to the better travel it allows

(NPS 1995c). Under the proposed action, visitation to the south side would increase by about 183,000 people per year by 2012, primarily as a result of the Tokositna developments. Given the assumption that at least a quarter of these visitors would participate in hiking or backpacking activities, the chance of human/bear interactions would increase above the current potential.

Several mitigating actions would be taken that would reduce the chance of encounters resulting from proposed actions. For trail projects on federal lands or which are funded by federal dollars, trail segments in bear habitat would be kept as straight as possible and brushy vegetation would be cleared from trail edges, maximizing sight distance. Where linear trail sections are not appropriate (e.g., due to an area being too wet to allow for a straight route), less densely vegetated sites would be selected. Development in areas of concentrated bear use such as salmon streams would be avoided. These measures would decrease the chance of surprise encounters between bears and humans, but would not eliminate it entirely (see the "Mitigating Measures Common to All Action Alternatives" section for additional detail).

Season of Use — Bears may congregate in the Tokositna area, near Chelatna Lake, and in the Dunkle Hills area during spring moose calving and in the late summer and fall when salmon spawn in nearby rivers and creeks and berries ripen. Byers Creek in the state park central development zone and the slopes east of the zone also attract bears during the salmon spawning and berry season, respectively. These periods would overlap with peak recreational use of the area by hunters, tourists, and anglers. The higher concentration of bears and humans during these times would increase the chances of encounters and conflict, possibly necessitating area or trail closures to reduce this risk. That this is a possibility is evidenced by the current need for temporary closures on the existing Troublesome Creek trail in the state park because of the high likelihood of bear/human encounters during certain seasons.

Habituation to Human Food — The evidence linking habituation of black and grizzly bears to human food with bear/human confrontations is extensive. Within parks in Canada and the United States, food-conditioned bears accounted for about two-thirds of all bear-inflicted injuries. Appropriate bear management practices (e.g., provision of bear-resistant garbage cans and food storage sheds, visitor education) would be instituted at the new developments proposed under this alternative from the beginning to try to ensure that no bears become accustomed to finding food at these locations. However, even with such management practices in place, some conflicts with food-conditioned bears would likely still occur.

Bear Mortality and Harassment. The more extensive a network of roads or development is the more likely the potential for human contact with bears and for human-caused bear mortality (Reynolds 1992; Donihee et al. 1982). Human-caused bear mortality can occur as a result of management actions against habituated or problem bears, hunting, poaching, defense of life or property situations, and automobile collisions (NPS 1992b; Reynolds 1992; Donihee and Gray 1982). Incidents of bear harassment could also increase.

As noted above, some bears may become habituated to humans or conditioned to associate feeding opportunities with humans or human facilities. If management perceived these bears as a threat to human safety, the bear(s) could be removed and relocated out of the area; as such, they would be considered a “mortality” in the ecosystem (NPS 1992b). On average, one to two grizzly or black bears are removed each year from the north side (an area that includes Denali National Park and Preserve, Kantishna, and private lands directly adjacent to the park entrance) because of problem encounters, primarily resulting from improperly stored food items (NPS 1995d).

Improving the Petersville Road would increase traffic levels, potentially increasing the number of bears killed on the south side or injured in collisions with automobiles. The George Parks Highway has posted speed limits of 55 and 65

up to 1970 (Herrero 1985). Although not common, there have been several reported cases of bears invading campsites on the south side to obtain food (NPS 1995c; Okonek 1995).

On the south side, grizzlies are hunted in the fall and spring (see the “Affected Environment” chapter). Expansion of the Petersville Road into the Tokositna area would improve road access to the area, increasing hunting pressure.

The Tokositna River drainage also has a history of bear poaching which, for the purpose of this analysis, is defined as the illegal taking of wildlife generally due to hunting out of season or without regard to regulations. A grizzly was poached in the Tokositna area in both 1992 and 1993 (NPS 1994). The potential exists for poaching to increase here and elsewhere as a result of increased and improved access via the Petersville Road. However, increased ranger presence in the area because of the new developments could negate this effect and actually decrease the amount of poaching on the south side.

New visitor facilities and services on the south side, including those along the George Parks Highway, could attract additional development of other lands in the area, which could lead to increased numbers of bears killed in defense of life and property. On average, one to two bears have been killed annually on the south side in the past 10 years because of the defense of life and property (Alaska State Troopers 1996). The anticipated increase of recreational use of the area resulting from new recreation facilities and improvement of the Petersville Road could also lead to more of these situations due to a higher frequency of encounters between bears and people.

mph in the south side study area, with past year ADTs ranging from the 800’s to 1,800 depending on when and where the counts were taken (see the “Affected Environment” chapter for details). An average of one to two bears are

killed per year on the section of the George Parks Highway between Talkeetna and Cantwell (Alaska State Troopers 1996). The existing speed limit on the Petersville Road near Trapper Creek is 45 mph, with an ADT level of 200 vehicles on the paved portion. Under the proposed action, the anticipated speed of the road would not increase, although the entire road, rather than just the first 3 miles, would likely be paved. With visitors traveling to the newly developed Tokositna area, ADT is expected to increase significantly. The impact of increased traffic levels on the number of bear-auto collisions may be negated if traffic levels cause bears to avoid the road more than they do under existing conditions.

The higher frequency of encounters between bears and humans could also lead to increased incidents of harassment. For the purposes of this analysis, harassment is defined as the intentional disturbance of wildlife by humans. There have been at least three reports of people on snowmachines chasing, wounding, and killing bears in the past three years (Okonek 1995; NPS 1995c). Harassment could alter bear movement, reproductive patterns, and feeding behavior, and, in the worst cases, cause the bear's death.

Conclusion

From 127 to 167 acres of prime grizzly habitat and from 16 to 50 acres of general grizzly habitat would be lost or disturbed. The entire 143 to 217 acres would also be considered a loss of general black bear habitat. Bears could also indirectly lose habitat if they are displaced due to proposed actions. Due to the widespread availability of bear habitat within the region, the loss of this amount of habitat is not expected to substantially impact bear populations. Increased human presence in the area could also lead to more frequent bear/human confrontations and contribute to higher levels of bear mortality, adversely impacting individual bears, but not significantly impacting the regional bear population. Measures would be taken to minimize these impacts.

CARIBOU

Analysis

Caribou habitat is generally limited to the northeast part of the planning area (see the "Affected Environment" chapter). Therefore, the only proposed action that may impact caribou would be providing new public access opportunities in the Dunkle Hills area for hiking, biking, and mining-related interpretation. The direct loss of caribou habitat resulting from this proposed action is expected to be minimal (about ½ acre) and associated only with the construction of a trailhead along the Dunkle Hills road. An additional unknown amount of habitat could be lost due to development of other land in the area (spin-off development) in response to the proposed action. However, the extent of such development would be limited by land use controls.

In addition to the direct loss of habitat, caribou could also be affected indirectly by increased human use of the Dunkle Hills as a result of this proposed action. Currently, there are several impediments to high human use of the area, including unresolved land status issues. It is assumed that as part of the proposed action these land status issues would be resolved. Given this assumption, most modes of access (pedestrian, bicycle, ORV, automobile) would be improved and, in turn, recreational and hunting use in the area would increase. Snowmachine use is already prevalent in this area and would not be increased significantly by the proposed action. Currently access to the Dunkle Hills road is also limited by the lack of a bridge across the Bull River. Construction of a bridge is not anticipated in the reasonably foreseeable future; however, if one were constructed, access to the Dunkle Hills area would be further improved and recreational and hunting use would increase to a greater extent. If a decision were made to construct a bridge, additional environmental documentation and public review would be needed.

Greater recreational use of the Dunkle Hills area would lead to a greater frequency of human-caused disturbance to caribou. Human disturbance, particularly by pedestrians, often results in caribou stopping normal foraging activities and fleeing (ADFG 1986). Fleeing requires an expenditure of energy that may already be in short supply. If a caribou requires more energy to flee than it can make up through foraging, it must depend on its body reserves to supply the extra needed energy. Continuous stress such as this can cause the illness or death of the animal. Cow/calf groups are typically more sensitive to disturbance than caribou groups without calves (Singer et al. 1986). Disturbance can also lead to caribou being displaced from parts of their habitat.

The effect of the proposed trailhead and associated human use on caribou disturbance and displacement would vary by season. Existing use of the Dunkle Hills area by the Denali caribou herd for calving is low. Every May since 1987, the National Park Service has conducted daily sampling in the Cantwell area of radio-collared caribou cows from the Denali herd (NBS 1995b). A total of 30–79 of the herd's radio-collared cows calved south of the Alaska Range each year during the study, ranging from upper Ohio Creek on the west to Windy Creek on the east. Of the 419 calves born over the course of the study, only about 4 or 5 were born to radio-collared cows in the vicinity of the Dunkle Mine, and most of these births occurred in 1995 calving season. Snow conditions and rugged terrain limit human access to the Dunkle Hills during the critical calving period; therefore, the trailhead and improved access would not be expected to have an impact on caribou calving. Use restrictions would be implemented if necessary during calving season, further decreasing the potential for adverse impacts on caribou. The Nelchina herd does not use the Dunkle Hills area for calving.

By the time the area is accessible to people (mid-June), the Denali herd has generally moved higher into the mountains of the Alaska Range. Due to the rough terrain, it is doubtful

many hikers would traverse these areas, even given promotion of the Dunkle Hills trailhead as an access point into Denali National Park and Preserve. It is, however, probable that cross-country hikers who do climb higher into the mountains may displace caribou groups from their path of travel. Caribou bands have been put to flight by a solitary person at 0.5 to 0.6 mile (NPS 1982). More lengthy displacement could also occur around backcountry campsites when occupied. Such displacement, however, would likely be temporary and would therefore not cause any long-term impacts on caribou distribution or populations.

By late summer and fall, the Denali herd is usually already back on the north side of the Alaska Range; some members of the Nelchina herd, however, do move to the Dunkle Hills area at this time. Improved access along the Dunkle Hills road during this time would increase nonsubsistence and subsistence hunting pressure in this area, which is currently lightly hunted. Increased human use in general could lead to more frequent incidents of caribou harassment, resulting in stress to individual animals. Again, however, visitor use would not be expected to have any long-term impacts on populations as such incidents would be expected to be minimal.

A portion of the Nelchina herd may remain in the area over the winter and, therefore, individual caribou could be adversely impacted if disturbed or displaced by cross-country skiers, snow-machiners, or other winter recreationist. However, no long-term impacts on the Nelchina caribou population would be expected.

If the Denali herd returned to its historic population level (20,000–30,000) or the Nelchina herd began to use the Cantwell/Broad Pass area at levels similar to those in the 1960s, the Cantwell calving grounds, and the Broad Pass area in general, could be used more. At historic levels, with large numbers of animals using the grounds, a concurrent increase in human use of the Dunkle Hills could raise the potential for human/caribou interactions, thus

increasing the frequency of caribou disturbance by humans.

Caribou use of the area inside Denali State Park and at Chelatna Lake is very limited; therefore, it is unlikely caribou would be affected by the proposed developments in these areas. The proposed roadside exhibits, regardless of where Loss of caribou habitat due to the proposed action would be minimal (about ½ acre). An unknown amount of habitat could be lost due to spin-off development on the south side. At current population levels, impacts on caribou from recreational use of the Dunkle Hills area would be minimal because recreation access and use of the Cantwell calving grounds in May would be limited by snow conditions and calving in this area is low. In addition, caribou do not generally use the Dunkle Hills area during the peak summer recreation season. In the fall and winter, though caribou may be adversely impacted by increased recreational and subsistence use, no long-term impacts on populations would be expected. However, at historic caribou population levels, with large numbers of animals using the grounds, a concurrent increase in human use of the Dunkle Hills area could raise the potential for human/caribou interactions, thus increasing the frequency of caribou disturbance by humans, which could cause displacement of caribou. Management actions could minimize or prevent these impacts.

MOOSE

Analysis

The following impact analysis assumes that several mitigating measures, including research and monitoring (see the “Mitigating Measures Common to All Action Alternatives” section), would be taken to ensure the proposed actions would not have adverse effects on moose populations and habitat.

Impacts on moose could result from the direct loss of habitat from facility siting, as well as habitat abandonment resulting from increased

they are located along the George Parks Highway, would also not impact caribou.

Conclusion

human use of the area. From 143 to 217 acres of general and winter moose habitat would be lost due the proposed developments. From 122 to 162 acres of this total would be a loss of critical winter range in the Tokositna River drainage, particularly the upper portion, the area north of the Petersville Road in the creek corridors, and in the Dunkle Hills area. An additional unknown amount of habitat could be lost due to development of other land in the area (spin-off development) in response to the proposed action. However, the extent of such development would be limited by land use controls. Considering there are several hundred thousand acres of general and winter habitat on the south side, the loss of this habitat would not be expected to have a major impact on moose populations.

Moose often successfully habituate to human developments. However, some moose could abandon general or critical winter habitat if they were unable to tolerate disturbance associated with proposed recreation developments or associated increased use of the area. This would result in an indirect loss of habitat. Increased recreational use of this area could cause some abandonment of winter range, especially in the Tokositna drainage, Little Peters Hills/Petersville area, Chelatna Lake, and along the Petersville Road. However, snowmachine and other trails where the snow is packed down often facilitate travel by moose (ADFG 1996c) and could have a beneficial impact on moose. Heavy snow conditions would cause moose to increase use of these trails and could result in increased conflicts between moose and recreation users such as snowmachiners, skiers, or dog mushers.

Improved access along the Petersville Road could increase hunting pressure in this area

which is already heavily hunted (ADFG 1989b). Increased access along the Dunkle Hills road could also increase hunting pressure in this area by both nonsubsistence and subsistence hunters. Greater hunting pressure could cause moose to be displaced from rutting and early-winter range. The number of incidents of moose harassment could increase as well, as more people gain access to the south side. Harassment could alter individual moose reproductive Facilities would be sited to avoid major wildlife travel corridors; therefore, no impacts on moose movement would be expected.

Conclusion

From 143 to 217 acres of general and winter moose habitat, including from 122 to 162 acres of critical winter range, would be lost or disturbed under the proposed action. An unknown amount of habitat could be lost due to spin-off development on the south side. Moose could also indirectly lose habitat if they are displaced due to proposed actions. This loss of habitat would not be expected to impact the moose population because moose habitat is abundant in the area. Improved access along the Petersville Road could increase hunting pressure in an area that is already heavily hunted. Improved access along the Dunkle Hills road area would increase nonsubsistence and subsistence hunting pressure in this area. Increased human use of the south side could lead to more frequent incidents of moose harassment, resulting in stress on individual animals, but probably not significantly affecting the regional moose population.

WOLVES

Analysis

Wolves could be affected by the proposed actions as a result of habitat loss due to facility siting and increased recreational use of the south side, although a lack of specific territory and denning information makes it difficult to determine the direct impacts to wolves in the

patterns and feeding behavior, causing stress to individual animals.

The indirect impacts discussed above would not likely affect the regional moose population for reasons similar to those presented at the beginning of the impacts section on grizzly and black bears.

vicinity of proposed developments. An estimated 143 to 217 acres of potential wolf habitat would be lost by facility construction. An additional unknown amount of habitat could be lost due to development of other land in the area (spin-off development) in response to the proposed action; the extent of such development would be limited by land use controls.

However, the loss of this amount of acreage, out of millions of acres of potential wolf habitat on the south side, would probably have little direct impact on wolves. Even the loss of denning habitat would not adversely affect wolf populations, as there are sufficient other sites for dens throughout the planning area.

Indirect habitat loss to wolves would also result from the proposed actions. Under the proposed action, facilities would be built in previously undeveloped or minimally developed areas (e.g., the Tokositna area). Introducing greater human use and development into these areas could have an adverse effect on local wolf populations. For example, factors such as increased noise, vehicle use, and human presence associated with the facilities would probably displace wolves, at least seasonally, from the immediate site. If a wolf pack had a den site or center of activity near proposed facilities, including trails, displacement of animals from that site could be expected. Wolves are known to abandon denning sites if they are disturbed during the early establishment of those sites. Human disturbance during periods when pups are present could reduce feeding opportunities by adults and potentially influence pup survival.

Wolves commonly travel long distances and cover large areas of territory in their search for

food (Ballard et al. 1987; Petersen et al. 1984). With a much higher human presence on the south side, particularly in the Tokositna area, the frequency of wolf/human interactions would also probably increase. These encounters could increase the level of disturbance for wolves and may cause an increase in mortality.

Increased vehicular traffic on the upgraded Petersville Road could lead to an increase in wolf mortality from vehicle collisions.

However, in general, wolves are infrequently killed by vehicles in Alaska; the most recent reported kill was near Anchorage in 1990 (ADFG 1996).

Conclusion

From 143 to 217 acres of wolf habitat would be lost or disturbed due to facility siting. An unknown amount of habitat could be lost due to spin-off development on the south side. This loss of habitat would have little direct impact on wolf populations in the area. If wolves are forced to abandon certain areas due to human use, this indirect impact would be greater on wolves than the direct loss of habitat. However, such indirect impacts would not be expected to affect regional wolf populations significantly.

TRUMPETER SWANS

Analysis

The forested wetlands of the south side provide summer range for trumpeter swans, as well as nesting, brood-rearing, and molting concentration areas. Other areas are used as staging and migration areas in the fall. The development of visitor centers and related facilities in the Tokositna area and central development zone of Denali State Park and primitive camping sites at Chelatna Lake would not directly affect trumpeter swans because these facilities would not be sited in swan nesting, brood-rearing, or molting areas. However, an unknown amount of habitat could be lost due to development of other land in the

Although specific information on wolf populations on the south side makes it difficult to determine the extent of indirect impacts, it is unlikely they would be significant for similar reasons as those cited at the beginning of the impacts section on grizzly and black bear. Measures would also be taken to minimize the impacts of development and use on wolves. area (spin-off development) in response to the proposed action; the extent of such development would be limited by land use controls.

Increased recreational use associated with these facilities may bring visitors in contact with these habitats during the breeding period when swans are most sensitive to disturbance. Swans are known to be extremely sensitive to human disturbance, with pedestrians generally having a greater effect on swan behavior than aircraft or vehicles (Hensen and Grant 1991). According to Henson and Grant, several studies have shown that human intrusions can result in temporary and permanent nest abandonment, as well as movements from breeding or staging areas. Disturbances, particularly those that cause nest abandonment, can impact productivity through increased nest predation rates, increased embryo mortality or retarded development due to egg exposure, changes in female energy budgets, and avoidance of otherwise suitable habitat (Henson and Grant 1991).

Although the risk of potential disturbance to swans would rise with increased recreational use, mitigating measures included as part of the proposed action would minimize the amount and frequency of disturbance to swans caused by human activity. Activities that could damage nesting habitat or cause visual or noise disturbance could be restricted or prohibited from April 1 through August 31 within .25 mile of active swan nests, staging ponds, marshes, or lakes (see the "Mitigating Measures Common to All Action Alternatives" section). Trails would be directed away from swan nesting/brooding sites to avoid disturbance. These measures would minimize adverse effects on swan populations and habitats.

Conclusion

The development of recreation facilities and increased visitor use in the Tokositna area, central development zone of Denali State Park, and Chelatna Lake area would not be expected to have a significant impact on trumpeter swans due to habitat avoidance and measures to minimize human interaction with swan populations. An unknown amount of habitat Proposed development and access on the south side would attract greater numbers of visitors to the area, including anglers. With increased numbers of anglers, there would be a resultant increase in fishing pressure on the local rivers and streams. For example, upgrading and extending the Petersville Road would expose the headwaters of Bunco Creek to more accessible fishing, while keeping a portion of the Tokositna visitor center open during the winter would probably facilitate ice-fishing in the area. If the campsites behind the Forks Roadhouse receive increased use by summer visitors on their way to Tokositna, increased fishing pressure could be placed on stocks of rainbow trout, grayling, and king salmon in Peters Creek and Martin Creek. The fisheries impact of primitive campsites and public use cabins on Chelatna Lake would depend on the location of these facilities; if either is located at the north end of the lake near the mouths of Snowslide or Easter Creeks, fishing for grayling, rainbow trout and king salmon could increase. Along the George Parks Highway, Byers and Troublesome Creeks and the east and middle forks of the Chulitna River would experience increased fishing pressure; however, access to these waters would be limited to near the highway unless trails are developed. Greater numbers of anglers fishing in these streams and rivers could adversely impact the aesthetic value of fishing for some people. The Alaska Department of Fish and Game has the authority to enforce regulations to prevent overfishing where necessary; therefore, increased numbers of anglers would not be expected to impact fish populations directly.

Fish populations may, however, be impacted indirectly from construction of the proposed

could be lost due to spin-off development on the south side.

FISH

Analysis

facilities, the facilities themselves, and associated increased human use. These activities could cause the loss of streambank vegetation, which, in turn, could degrade fish habitat by creating adverse water temperatures, increasing sedimentation, decreasing bank stability, and reducing food availability (e.g., terrestrial insects) (Clark, Gibbons, and Pauley 1985). Woody debris that normally helps create pools, riffles, and shelter for juvenile and adult fish, would also be limited without a source of streamside vegetation. Changes in upland soils and vegetation may affect rates of run-off and erosion and also impact water quality. The precise level of impact on fish habitat resulting from the proposed action would be determined when site-specific location and design details for the proposed facilities are developed; however, measures such as implementing best management practices during construction activities would be taken to ensure that impacts remain minimal (see the “Mitigating Measures Common to All Action Alternatives” section).

As noted in the impact analysis for vegetation, the proposed facilities likely could lead to increased development of other lands on the south side. Land use controls which limit development would minimize the amount of fish habitat lost or adversely impacted as a result of construction activities.

Conclusion

The proposed action would lead to increased numbers of anglers using local streams, potentially adversely impacting the aesthetic experience of fishing for some people; however, fish populations would not be directly impacted

by increased visitation due to adjustments in seasons and catch limits by the state. Fish populations may be impacted indirectly through degradation of habitat associated with facility siting, spin-off development, and increased recreational use of the area. The precise level of impact on fish habitat would be determined when site-specific location and design details for the proposed facilities are developed.

It is not known where, or if, American peregrine falcons (endangered), Arctic peregrine falcons (delisted, but still to be monitored), northern goshawks (species of concern), or olive-sided flycatchers (species of concern) nest or breed near any of the proposed south side development sites, though, based on vegetation in these areas, it is likely that they do. The North American lynx (species of concern) probably inhabits the spruce forests in the Denali State Park central development zone, as well as along the Petersville Road. As noted in the “Affected Environment” chapter, two plant species of concern, *Taraxacum carneocoloratum* and *Smelowskia pyriformis*, may also exist on the south side. Surveys would be completed for each site during subsequent environmental analysis to identify the existence of or critical habitats for these species near proposed development sites and to analyze potential impacts. Consultation with the U.S. Fish and Wildlife Service regarding such species would continue. Measures developed as part of this consultation would ensure that any of these species found to occur in the study area would not be affected by the proposed action. Therefore, under this proposal, no impacts would be expected on the above listed species or species of concern.

The Tule greater white-fronted goose, considered to be a species at risk, does use wetlands in the vicinity of the Tokositna Glacier and along the Petersville Road. The development of visitor centers and related facilities in the Tokositna area and central development zone of Denali State Park and primitive camping sites at Chelatna Lake would not affect these geese, as these facilities would not be sited in nesting, brood-rearing, or molting areas. However, an unknown amount of

However, measures would be taken to ensure that impacts remain minimal.

THREATENED, ENDANGERED, OR SENSITIVE SPECIES

Analysis

habitat could be lost due to development of other land in the area (spin-off development) in response to the proposed action, although the extent of such development would be limited by land use controls.

Increased recreational use associated with these facilities may bring visitors in contact with these habitats during incubating and brood-rearing periods when geese are most sensitive to disturbance. Human disturbance during incubating and brood-rearing periods may cause geese to temporarily or permanently leave their nests or to abandon breeding areas altogether. Although the risk of potential disturbance to geese would rise with increased recreational use of critical habitat areas, measures included as part of the proposed action would reduce or avoid disturbance.

Conclusion

The American peregrine falcon is the only federally endangered species that may occur on the south side. Several federal and state species of concern may be present, as well. Surveys conducted as part of subsequent environmental analysis would determine for certain whether these species inhabit the study area. Consultation with the U.S. Fish and Wildlife Service regarding such species would continue. Measures developed as part of this consultation would ensure that any of these species found to occur in the study area would not be affected by the proposed action. Therefore, under this proposal, no impacts would be expected on listed species or species of concern.

An unknown amount of habitat for the Tule greater white-fronted goose, considered a

species at risk by the International Waterfowl Research Bureau, may be lost due to spin-off development, although not from construction of proposed facilities themselves. Additionally, increased recreational use associated with the proposed facilities may disturb the geese, possibly causing some to abandon habitat. However, measures taken as part of the Siting of visitor facilities and associated increases in recreational use could potentially impact air quality on the south side by increasing levels of pollutants in the air, particularly during construction stages. Dust levels would increase in the immediate vicinity of the construction sites. Large amounts of dust can degrade local visibility and, if deposited on leaves or vegetation, can interfere with plant respiration. Several dust suppression measures would be used, as appropriate, during construction to limit the amount of airborne particulate, including sprinkling unpaved construction areas with water to reduce fugitive dust emissions (see the “Mitigating Measures Common to All Action Alternatives” section). In addition, phasing for road construction and paving would be expected to result in some road segments remaining unpaved for up to several years, lengthening the time the area is subjected to higher dust levels.

Volatile hydrocarbons and other organic compounds in the new asphalt used to pave the Petersville Road and visitor center parking lots would enter the air during construction and for a short time after construction is completed. Asphalt emissions typically may contain carcinogenic compounds. Diesel-powered construction equipment would emit nitrogen oxides, photochemical oxidants, carbon monoxide, and other types of particulate matter — pollutants known to cause such damage as chlorosis in leaves, increased eutrophication of lakes and ponds, acidification of soils, surface and ground waters, and visibility impairment. Under the proposed action, increases in these forms of pollution would be intermittent and temporary, lasting only during construction of each of the project phases; therefore, no long-lasting effects would be anticipated. Measures would be taken to

proposed action would reduce or eliminate the likelihood of such disturbance.

AIR QUALITY

Analysis

ensure that air quality impacts from construction would be minimal.

Once the facilities were constructed, commercial and recreational vehicle traffic, primarily on the George Parks Highway and the Petersville Road, would increase dramatically, corresponding with the estimated 183,000 (year 2012) additional people per year expected to take advantage of the Tokositna facilities. Associated with this increased visitation would be an increase in both recreational and commercial automobile traffic on area roads, although the level and mix (e.g., bus, automobile, RV) of this increased traffic is unknown. Gasoline-powered vehicles emit many of the same pollutants as diesel-powered engines, including nitrogen oxides, photochemical oxidants, and carbon monoxide. The facilities would also likely attract greater use of the area by snowmachines and ORVs that are less fuel efficient than automobiles and emit greater levels of pollution into the air.

Depending on weather conditions, local air quality also could be adversely affected by campground campfires and, possibly, by emissions (e.g., woodsmoke) from heating stoves if these are used in the new employee housing.

As discussed in the “Affected Environment” chapter, no exceedances of national ambient air quality standards or class I increments have been documented inside Denali National Park and Preserve. Because baseline air quality data are not available specifically for the south side study area, and because the level and mix of increased traffic resulting from the proposed action is unknown, it is not possible at this time to quantify the long-term impacts on air quality of the proposed action. It is likely that increased

traffic along the Petersville Road resulting from the proposed action would adversely impact air quality in the area to a greater extent than that which would occur if the proposed action were not implemented. However, on the remainder of the south side, impacts on air quality from proposed developments and associated human use likely would be minor compared to the effects of other existing or future south side actions. For example, because the George Parks Highway is a major travel corridor in the state, traffic levels on this road would continue to increase whether or not the proposed action was implemented, and resulting automobile

Conclusion

Short-term impacts on air quality, such as dust and vehicle emissions from construction-related activities, would be intermittent and temporary, and occur during construction of each of the project phases, as well as while improved sections of the Petersville Road remain unpaved. While long-term impacts on air quality cannot be quantified at this time, it is likely that the proposed action would adversely impact air quality in the Petersville Road area to a greater extent than that which would occur if the proposed actions were not implemented. Air quality impacts from proposed developments and associated human use would likely be minor throughout the rest of the south side compared to the effects of other existing or future south side actions.

WATER QUALITY

Analysis

Construction and siting of the proposed facilities, as well as increased visitor use of the south side resulting from these facilities, could impact water quality by increasing sedimentation and turbidity, altering water flow and hydroperiods, and contaminating the water with pollutants and additional nutrients.

Construction activities, particularly along the Petersville Road, could cause slight increases in the concentration of suspended sediments in

emissions would be greater and have a larger impact on air quality than would the proposed action.

The proposed facilities could lead to increased development of other lands on the south side. Land use controls which limit this development would minimize impacts on air quality. For example, there would be fewer impacts resulting from construction (dust levels, emissions from construction vehicles, etc.) given restrictions on development.

nearby streams and could also result in temporary increases in turbidity. As noted in the impact analysis for fish, sedimentation and turbidity can also increase as a result of trampling of streambanks and upland soils by recreationists. Suspended sediment can affect life-cycle phases and requirements of salmonids and other fish species; however, minor increases in sediment and turbidity can be tolerated for short periods (see table 4 for data on existing sediment and turbidity levels for specific south side streams and rivers). Measures would be taken to ensure that impacts from sediment loading and turbidity remain minor (see the "Mitigating Measures Common to All Action Alternatives" section).

Proposed building and roadway developments could impact the free flow of water by reducing connections between wetland areas or changing current patterns and siltation. However, measures would be taken to reduce the potential of such impacts.

During construction, if large quantities of liquid petroleum asphalt were used, accidental spills or runoff could contaminate nearby water sources, potentially adversely affecting human health, aquatic life, and wildlife. Asphalt contains many organic compounds with varying physical, chemical, and toxicological properties. Exposure to petroleum can taint well water and edible fish species, causing a public health problem. The polycyclic aromatic hydrocarbons (PAHs) in asphalt can cause cancer in laboratory animals and therefore are probably

toxic to humans. Oil in water can damage waterfowl feathers causing death, coat fish gills, and increase biochemical oxygen demand, killing fish and aquatic invertebrates. The sticky and heavy properties of petroleum asphalt Measures would be taken to protect aquatic resources from petroleum and toxic substances are described in the “Mitigating Measures Common to All Action Alternatives” section. These measures would help reduce any potential impacts from accidental spills or contamination of rainwater runoff if liquid asphalt is used. After the asphalt surfaces are completed, rain may continue to wash some hydrocarbons from the road into nearby waters. But, since asphalt is very adhesive and relatively insoluble, it is very likely that hydrocarbons in rain runoff would be at very low concentrations. There is limited PAH toxicity or bioconcentration data for freshwater organisms. However, existing data indicates that low concentrations of PAHs that enter water could adversely affect sensitive aquatic organisms (NPS 1993b).

As noted in the impact analysis for vegetation, the proposed facilities could lead to increased development of other lands on the south side. Land use controls that would limit construction activities would, in turn, reduce the potential for impacts on water resources from such activities.

Human wastes from backcountry operations, campgrounds, fish-cleaning sites, and other facilities may cause nutrients to be added to the water, potentially altering plant and animal communities by increasing the demand for dissolved oxygen. For example, fecal coliform bacteria and *Giardia lamblia* cysts may contaminate the water as a result of improper human waste disposal. *Giardia lamblia* is found in watersheds on the south side. Measures such as proper siting and treatment of human waste would be taken to ensure that the levels of added nutrients were minimal.

Conclusion

Construction and siting of visitor facilities and associated road improvements, as well as

causes it to sink and adhere to stream and lake bottom sediments. Oil in sediments tends to be persistent and has long-term effects on the benthic community (NPS 1993b).

recreational use, could impact water quality by causing increases in sedimentation and turbidity, alteration of waterflow and hydropatterns, and contamination of the water with pollutants and additional nutrients. Most water quality impacts would be temporary, lasting only during construction, and these would be minimized through adherence to best construction practices. Likewise, measures would be taken to minimize any longer-term impacts on water quality.

ARCHEOLOGICAL RESOURCES

Analysis

Since site specific information is not available, the following analysis is based on nearby general survey work (see the "Affected Environment" chapter for further information on archeological resources).

None of the lands on which development would occur has been surveyed for archeological resources. The roadside exhibits along the George Parks Highway would be within the previously disturbed road edge and would not constitute a threat to unknown archeological resources. Trails would be relatively confined developments, and their proposed locations could be adjusted if archeological sites were found before or during trail design.

Every effort would be made to avoid significant resources during project design as noted in the “Mitigating Measures Common to All Action Alternatives” section.

Conclusion

The proposed action would not affect any known archeological sites, and if archeological resources were encountered during more

detailed site planning or construction, facility relocation or mitigation would provide acceptable protection.

HISTORIC RESOURCES

Analysis

None of the known historic resources (Windy Creek cabin, Curry Lookout, and the Talkeetna Historic District) would be adversely affected by the proposed action, as no facilities are

Conclusion

The proposed action would not affect any known historic resources.

SUBSISTENCE

Analysis

Denali National Park and Preserve.

Development on Denali National Park land under the proposed action would include several short trails from the Tokositna overlook site to alpine terrain within the national park, and a trail from state land on the north end of Chelatna Lake to alpine terrain within the national park. The extent of the trail system inside the national park would be very limited. A small amount of vegetation would be impacted by trail construction. Considering the large extent of vegetation in the planning area and the limited nature of these trails, it would not cause a significant impact on wildlife habitat, and its potential to reduce important subsistence wildlife populations would be minimal.

Pending resolution of land status issues, the proposed action recommends establishing a trailhead along the Dunkle Hills road to improve access into Denali National Park. Human use of the Dunkle Hills area during the spring is unlikely to impact the Denali caribou herd's use of the south side calving grounds at present caribou population levels. However, if the Denali caribou population returns to historic

proposed for these areas and no related increases in recreational use of these sites are expected. However, after consultation with the Alaska state historic preservation office and a search of Alaska Heritage Resource Survey sites in the area, it is evident that placer mining may have occurred near the areas of proposed action. Site survey prior to development should consider the placer mining features typically associated with mining cultural landscapes.

levels, adverse impacts during this sensitive calving/post-calving period could be significant if unrestricted visitation during this time results in disturbance or displacement of caribou. Managing visitation could minimize impacts on caribou.

Nearly all of Denali National Park's south side subsistence users reside in the Cantwell and upper Chulitna River region. Windy Creek, Cantwell Creek, Bull River, and Dunkle Hills are important subsistence resource use areas within Denali National Park. The primary subsistence use activity is moose and caribou hunting that occurs from August through September, a time period that coincides with popular recreation visitation.

Increased recreational use of the Dunkle Hills during summer and fall months may cause the temporary displacement of moose and caribou populations resulting in subsistence users having to travel farther to locate animals. This potential recreational disturbance is not expected to cause lasting redistribution of wildlife populations or result in reduced wildlife populations.

Increasing visitor use and sport fishing in the Dunkle Hills area has the potential to adversely affect fish populations. However, NPS regulations and provisions of ANILCA provide the tools for adequate protection for fish and wildlife populations on federal public lands while ensuring a subsistence priority for local rural residents.

All rights of access for subsistence use on NPS lands are granted by section 811 of ANILCA. The park and preserve are managed according to legislative mandates, NPS management policies, and guidelines in the approved *Denali General Management Plan*. No proposed actions would affect the access of subsistence users to natural resources within the park and preserve.

National park lands are not open to sport hunting. No increase in competition for subsistence hunting is expected on park lands in the proposal area.

Continued implementation of the ANILCA provisions would mitigate any increased competition from resource users other than subsistence users. Therefore, the proposed action would not be expected to adversely affect resource competition.

State/Borough Lands in the South Side Study Area. As outlined in the vegetation analysis, a relatively small portion of the study area would be disturbed, and thus there would be no significant direct effect on subsistence use. The expected impacts on subsistence stem primarily from projected increases in public access and community growth in any given area. Such increased public use and access can displace animals from more easily accessible areas and add to hunting pressure through competition. This in turn can cause subsistence users to look elsewhere for their food. Increased hunting and fishing pressure could also lead to reductions in seasons and bag limits by the state, which could also contribute to displacement of use. The Alaska Boards of Game and Fisheries would continue to manage hunting and fishing to maintain healthy fish and wildlife populations. In addition, public safety concerns in the immediate vicinity of visitor centers, campground, and trailheads could lead to small areas being closed to the discharge of firearms.

The proposed Tokositna visitor center and the Petersville Road lie entirely within game management unit 16(a), which is a non-subsistence area. Thus, by definition, no subsistence uses would be directly affected in this immediate area. The added competition for

National park and preserve lands are open to sport and subsistence fishing. Visitor use activity in the Dunkle Hills and Broad Pass area could increase the competition for subsistence fish resources. However, NPS regulations and provisions of ANILCA mandate that if and when it is necessary to restrict taking of fish, subsistence users are the priority consumptive users on federal public lands and would be given preference on such lands over other consumptive uses (ANILCA, section 802(2)).

fish and wildlife resources in unit 16(a) by local and nonlocal residents would, however, cause some of the existing use along the Petersville Road to move to adjacent game management units. Most of the displacement from unit 16(a) would likely shift to unit 16(B) to the south, thus adding competition for subsistence resources in that unit (e.g., Skwentna and vicinity).

The addition of a small visitor center along the George Parks Highway in the central development zone would not likely affect subsistence use on either side of the highway. The highway, existing trails, and public and private campgrounds along the highway already provide considerable access to the state park. Most new visitors to the visitor center would be enroute to other areas and not expected to engage in activities that conflict with subsistence uses. In addition, the central development zone does not have substantial private land inholdings upon which secondary private development would be triggered.

The addition of a trailhead along the Dunkle Hills road would cause increases in public use in game management unit 13(E), primarily affecting residents of Cantwell, either by direct competition for resources and lower harvest rates, or by causing some displacement of existing use to other areas to the north and west.

The trail and one or two public use cabins at Chelatna Lake would likely have little effect on overall subsistence use patterns. Since this remote area is generally only accessed by air,

the increase in public use attributable to these facilities would be minimal.

Conclusion. The proposed action would not result in a significant restriction of subsistence users. The small acreage required for constructing facilities and hiking trails under the proposed action should not significantly impact fish and wildlife resources used for subsistence purposes and subsistence activities. The influx of visitors and the population growth in local communities may create competition for subsistence resources in the Skwentna area, adjacent game units, and Cantwell due to the Petersville Road upgrade and Tokositna development and improved access into the Dunkle Hills. Monitoring of visitor increases and population growth in local communities would ensure that steps can be taken to mitigate any impacts that might occur, thus avoiding significant effects on subsistence activities and resources used for subsistence purposes.

MATANUSKA-SUSITNA BOROUGH ECONOMY AND SOCIAL ENVIRONMENT

Analysis

Construction or operations of a visitor center or other visitor facilities would generate economic impacts, including associated benefits and costs. For example, construction and other development activities are costly and also provide jobs and earnings for local and nonlocal workers, while operation activities involve substantial outlays for workers and other park support functions. Visitor use creates visitor expenditures for basic needs (lodging, meals, etc.) and education/pleasure (tours, recreational activities, etc.). Visitor expenditures provide employment and income for workers such as hotel/motel and restaurant employees and transportation. Recreation/tourism workers would be needed to operate and maintain facilities and provide visitor services.

Regional economic impact analysis was undertaken by evaluating the anticipated

spending patterns of visitors and the incremental costs of construction and operations associated with the various alternatives. NPS and state of Alaska construction and operations outlays and tourism-related visitor expenditures were allocated among industrial sectors pertaining to the input-output accounting framework of “IMPLAN” (1991-F Version), an economic impact model developed by the U.S. Forest Service. Input-output multipliers from IMPLAN can be used to estimate the impact of direct expenditures on additional indirect activity due to spending on intermediate goods and services, and induced activity due to re-spending of earnings by direct recipients (businesses and households) engaged in the visitor/tourism industry. The study area for the IMPLAN model consists of the Matanuska-Susitna and Denali Boroughs for purposes of assessing NPS operations and visitor impacts. The area of analysis is expanded to include the Anchorage Borough for purposes of assessing construction impacts.

The analysis considers development of a visitor center (up to 5,000 square feet) at the proposed

Tokositna site, a visitor center (up to 3,000 square feet) in the central development zone in the state park, 50 campsites each at Tokositna and in the central development zone, interpretive trails, hiking trails, public use cabins, staff housing at Tokositna, and added pullouts and interpretive signs. This alternative would improve access to the south side of Denali National Park and Preserve and Denali State Park. The Tokositna component of the proposed action would provide an alternative to the existing north side Denali National Park and Preserve experience. Reallocation of potential north side visitors would be facilitated by improved availability of major viewing and access improvements on the south side, particularly at the Tokositna site. Increased numbers of users would include package tour and independent out-of-state tourists and Alaska residents looking for recreational activities, interpretation, sightseeing, backcountry access, lodging, and other experiences.

For the purposes of this analysis, it is assumed that the construction of park facilities and the Petersville Road upgrades would be roughly The rationale for visitor projections used in this document for the south side region is basically three-fold. First, as noted in the “Affected Environment” chapter concerning visitor use, Denali National Park and Preserve facilities are at or near peak use given the existing constraints on vehicle access during the core season. This condition has persisted for several years and generally is expected to continue (although a new plan for the entrance area and road corridor would increase the capacity of that area somewhat). Anecdotal evidence suggests that Alaska residents and independent nonresident visitors have experienced the greatest adverse impacts because of the current access limitations as they are less likely to make travel and lodging arrangements far in advance, compared to package tour operations and, thus, may feel frustrated by the limitations placed on park road use.

Secondly, future growth in Denali National Park and Preserve visitation, particularly of non-Alaska residents (mostly package tour and inde-

concurrent. Since the latter is critical for development of the Tokositna visitor center, scheduling decisions are interrelated to the Alaska Department of Transportation and Public Facilities funding and construction program priorities. For purpose of analysis, it is assumed that the road and facilities would be constructed near the end of the decade, or within the first year or two of the next century. (Completion of the road and Tokositna facilities may take longer.) Construction costs for the road work are estimated to be up to \$36 million (note that design and compliance costs would add another \$3 million, for a total estimated cost of \$39 million, as shown in appendix E). The annual costs for road maintenance would be an estimated \$127,650 (about mile 19 to 41). In addition, up-front equipment costs are expected to range between \$125,000 and \$350,000. Construction costs for park facilities improvements are estimated at about \$7.2 million (total costs are estimated at just under \$9 million), of which \$4.3 million would be required for the Tokositna area.

package visitors) is likely to be impeded due to the limitations on capacity along the existing park road. Overall, nonresident visitation grew by about 59% between 1989 and 1995 or 8.0% on an average annual basis. Visitor arrivals by cruise ship and domestic airlines (primarily with package tours) have been the largest contributors to the high historical growth in visitation. This pattern is expected to continue. Cruise ship capacity (planned and contracted berths) is projected to increase at 7% per annum through the end of the decade. According to a respected industry source (Kelsh Company), Princess Tours and Holland-America are projected to sell about 146,000 package tour visits to Denali/McKinley in 1997 increasing to 205,000 in year 2001. The same source projects total visitation to the Denali/McKinley area of 450,000 in 2005 increasing to 700,000 by 2020, based on current trends. Even if the visitation levels projected are not sustained due to capacity problems or shifts in market demand, future visitation would likely exceed current levels by a wide margin.

Thirdly, the Tokositna site is expected to draw many destination visitors to the south side area. This is because visitor experience would be comparable in some respects to that provided in the north side of Denali National Park and Preserve. While the south side lacks the superb wildlife viewing opportunities, the Tokositna site presents the visitor with the sense of the remoteness, power, and majesty of the Alaska Range and an unparalleled view of Mount McKinley. Given the proximity of the site to Denali National Park and Preserve, most visitors would have a sense of “touching” the park. Thus, a Tokositna visitor center would represent a drawing card for visitors traveling either on package tours or independently. In addition, the trip to the site on the Petersville Road would add to the experience of travel through the backcountry with magnificent views of lakes, streams, tundra, mountains, and occasional wildlife. Once at the Tokositna site, the visitor would have the opportunity to experience the backcountry on foot. A trail system would be available providing relatively short nature walks. Visitor projections were made to evaluate impacts on the regional economy and for facilities space planning. Table 12 presents visitor projections for the proposed action for the various tourism/visitor groups in five-year increments during the period 2002 to 2012. Projected visitation to the Tokositna visitor center amounts to 92,000 in 2002 for all groups. By 2007 the projected figure increases to 169,000, further increasing to

as well as extended hikes to Denali National Park and Preserve alpine terrain.

In summary, Tokositna has the capability to attract visitors to the region as a primary destination. It would provide an alternative destination to the north side for many visitors seeking to experience the Alaska Range and Denali National Park and Preserve. The visitor center proposed to be located along the George Parks Highway inside Denali State Park under the proposed action would attract fewer new or incremental visitors to the area. It would serve primarily as an intermediate stop and information/orientation center for visitors traveling on to the north side and those already using Denali State Park. Consequently, visitors to the visitor center along the George Parks Highway would be considered to be either part of the visitor baseline or part of the increment projected for the Tokositna visitor center. Thus, a separate projection of visitation to this visitor center was not prepared.

207,000 in 2012, the final year of the projection horizon. These figures represent the maximum expected visitation to the facility for the time periods indicated and include visitors from the new Princess Tour hotel, which is expected to open in 1997.

TABLE 12: VISITOR PROJECTIONS FOR TOKOSITNA VISITOR CENTER -- YEARS 2002, 2007, AND 2012

Visitor Groups	Year 2002	Year 2007	Year 2012
Baseline Visitors	14,500	18,500	23,500
Incremental Visitors *	77,500	150,500	183,000
Non-Alaska Residents			
Package - Overnight *	30,000	64,500	78,000
Package - Day	6,000	13,000	16,000
Inde-Package	15,000	32,000	39,000
Independent	10,000	21,000	26,000
Subtotal	61,000	130,500	159,000

Other Visitors			
Residents	10,000	11,000	13,000
Nonresidents Visiting Friends and Relatives	6,500	8,500	11,000
Subtotal	16,500	20,000	24,000
Grand Total	92,000	169,000	207,000

*Includes 19,000 visitors associated with the new south side Princess Tours hotel.

The figures in table 12 reflect visitation by existing baseline and new or incremental visitors to the region. Visitors at the new hotel near mile 133 of the George Parks Highway are considered incremental for purposes of assessing impacts on the Petersville Road and at the Tokositna site. The new hotel, along with developments in the proposed action, would stimulate incremental visitation growth in the south side region. However, the estimated 19,000 person-visits associated with the new hotel *are not* considered to be incremental for purposes of assessing impacts on the regional economy, but instead are treated as part of the baseline. Therefore, after excluding visitors at The estimates of construction and operations outlays and visitor projections are key elements in the analysis of socioeconomic impacts. For purposes of the analysis, economic effects are divided into two categories: direct and indirect/induced. Direct effects result from NPS and state of Alaska construction and operations outlays and visitor expenditures on goods and services provided by local industries. Indirect/induced effects represent spin-off activities or ripple effects caused by increased direct expenditures within the region. These are estimated using the IMPLAN model. Details of the regional economic impact analysis are provided in appendix L.

Direct Effects. Constructing the proposed visitor centers and other park facilities on the south side is estimated to cost \$7.2 million (in 1995 dollars). Construction would generate about 53 jobs with estimated earnings of \$2.0 million. It is likely that a significant portion of the jobs and earnings would go to locally hired workers.

the new hotel, incremental visitation to the region (which is used to assess regional economic impacts) is estimated at 73,000 in 2002, 150,000 in 2007, and 188,000 in 2012. It is worth noting that a second major package tour hotel is assumed to be developed in the south side area between 2002 and 2007 in response to the tourism demand stimulated by the proposed action. The hotel would also accommodate an estimated 19,000 person-visits.

Further discussion of south side visitor demand and the visitor projection methods for the proposed action is presented in appendix K.

Upgrading the Petersville Road is estimated to cost up to \$36 million (with design and environmental compliance costs included it would total about \$39 million). Other required road access improvements would add \$0.4 million in construction costs. Construction would generate about 224 jobs with estimated earnings of \$8.4 million. Many of these construction jobs would also be filled by locally hired labor.

Visitation has been projected for the Tokositna visitor center to total about 92,000 in the year 2002 of which about 77,500 are incremental visitors above the about 14,500 baseline visitors. Incremental visitation at the small visitor center in the central development zone is expected to be modest; however, baseline visitation — i.e., visitation by persons traveling for other reasons on the George Parks Highway — would generate many visits to this facility. Incremental visitor expenditures for the year 2002 have been projected by visitor category —

i.e., package tour (excluding 19,000 person-visits associated with the new Princess Tours hotel), independent, in-package, non-Alaska resident visitors, as well as resident visitors and nonresident visitors who are visiting friends and relatives. These incremental expenditures were accumulated from detailed estimates of expected visitor expenditures for the major groupings of transportation/guide services; lodging; food and beverage; retail shopping; and auto/RV fuel and other services. Total incremental visitor expenditures (in 1991 dollars) were projected to be about \$4.1 million in 2002. In addition, NPS outlays for personnel would amount to about \$0.4 million when the facility is in operation. Together, these expenditures would generate about 112 direct jobs with earnings of \$1.6 million (in 1991 dollars).

Population and Housing. Population effects from the expansion of public facilities at the south side of Denali associated with the proposed action might include in-migration of NPS and state park seasonal workers for the operating season. Also, a few workers might relocate to areas near construction sites during facility construction. Housing for both groups, especially for construction phases, might be provided by employers in camp-like facilities such as cabins or RVs with, perhaps, group facilities such as dormitories, kitchen and dining halls, and centralized restrooms/shower facilities. The available housing stock contains a substantial number of recreation cabins, second homes, or other part-time use residences that may not be available for sale or rent. Some housing may be available from the current stock, but more likely there would be a need to develop some additional employee housing, especially near the Tokositna site. Unless group quarters, as just sketched, were developed for workers there would likely be demand for NPS and state seasonal worker housing facilities during the work seasons. There would also be some increase in population due to new private businesses in the area and a need for employee housing for these businesses.

Indirect Effects. For the proposed action, indirect and total impacts have been projected for facilities construction (both park facilities and road improvements) at 196 and 472 workers with earnings of about \$4.3 million and \$14.8 million, respectively. Indirect and total impacts associated with visitor expenditures have been projected for year 2002 (assumed first full year of new facility operations) at about 50 workers with \$0.9 million in earnings (in 1991 dollars) and 161 workers with about \$2.4 million in earnings (in 1991 dollars), respectively. The indirect impacts would result from the construction and operation of new lodging accommodations, restaurants, and other visitor attractions in the south side region.

Overview of Socioeconomic Effects

Economy. Economic benefits from facilities construction and operation and visitor use increases would accrue to local residents in the area in the form of jobs and earnings. The construction phase would employ building and road construction workers and require construction equipment, construction supplies and materials, and highway and perhaps rail services to haul heavy materials to job sites. The operations phase would require staffing for hotel maintenance, hospitality, food service, park maintenance, ranger, and interpretive activities. Other employment opportunities could include mining demonstrations in the Peters Hills area, river rafting, flightseeing, etc. Direct, indirect, induced and total impacts would accrue to local residents in the form of increased jobs and earnings as reported above.

Land Use. Land uses on the south side would change to respond to additional visitor use in the area, including additional lodging, food service, and retail sales outlets, as well as associated employee housing and support development. It is also likely that changes in land use patterns would occur simply as a result of improving the Petersville Road, with increased residential and commercial development (which may or may not be related to visitor use) taking place in the area.

One of the assumptions underlying the proposed action is that the Matanuska-Susitna Borough would undertake land use actions to direct the form and location of development on the Petersville Road and the George Parks Highway. This would deter inappropriate development along major transportation corridors, without necessarily adversely impacting existing local businesses. Another underlying assumption is that the Matanuska-Susitna Borough would undertake a corridor management plan that would identify the land use management guidelines that are needed and provide for mechanisms that would be used to implement the guidelines, including scenic highway corridor recommendations. Similarly, providing vegetation buffers and restricted signs along the roadways are mechanisms that may be considered by the borough. Conveyance restrictions could be imposed on borough lands as part of the management guidelines prior to any sales to private development interests. The borough may also consider land exchanges with the state in specific cases.

Other than mining activities, no private developments would occur along the Petersville Road past the Forks Roadhouse, since this area is entirely state owned and managed for retention in state ownership according to the *Susitna Area Plan*. The *Susitna Area Plan* Fire protection would likely need to be developed at Trapper Creek. Ambulance service, available in the Matanuska-Susitna Borough on an areawide basis, is modest in Trapper Creek (one vehicle) and would likely need to be expanded. Traffic volume increases associated with south side development likely would require augmented EMS and fire protection facilities at Trapper Creek. The demand for these services would be attributable to both project-related growth (associated with the proposed action) and baseline growth. The Matanuska-Susitna Borough might consider developing a combined fire and EMS station that could house two ambulances and a fire truck. During the summer months, May 15 through September 15, a likely scenario would include two 3-person crews. One of the crews

would likely be modified to prohibit additional land disposals along the Petersville Road between the George Parks Highway and mile 19 (Forks Roadhouse).

The benefits of land use actions would accrue disproportionately, however. Visitors and providers of tourism services (mostly downstream from the area, such as cruise ship lines, hotel operators, and other transportation providers) would derive benefits. Some local landowners and small businesses could be adversely affected by instituting land use actions due to the inconvenience of obtaining permits or higher investment costs associated with compliance. Conversely, instituting such actions would benefit local businesses and landowners because of the protections they would offer by ensuring orderly development that is compatible with the natural character of the area. It is assumed that the proposed action would include implementation of land use actions as described.

Municipal Services. Public services are likely to require improvements due to the proposed action. Infrastructure requirements include the improvements to the Petersville Road and possible associated services. This would increase operation and maintenance costs.

would be active and receive per diem of \$50.00; the other crew would be inactive, receiving a lesser sum, perhaps \$10.00 per day. Provisional estimates of the capital outlay for the station and equipment amount to \$200,000 for the station, \$150,000 for a fire truck, and \$100,000 for an ambulance for a total of \$450,000. Operational costs would amount to \$21,800 for personnel plus an undetermined amount for maintenance, supplies, and overhead. The source of funds could include property tax revenues from a fire service area, if established at Trapper Creek, direct payments by the borough for areawide services, and special mitigation from private, state, and federal sources.

Police services are provided by the Alaska State Troopers. It is anticipated that Alaska State

Troopers would be able to keep pace with local needs within the context of statewide priorities.

Primary and secondary education services are provided on a boroughwide basis. The school district is coterminous with the borough. Population growth associated with the proposed action would likely cause some enrollment expansion at both the elementary and secondary levels and could result in the need for additional facilities and operational resources. As noted in the discussion of the “Affected Environment,” revenue allocations are made at the district level. Similarly, boroughwide property taxes are used primarily to support primary and secondary education. There is no service area tax levy to support public education.

Trapper Creek has an established road service area with responsibility for 39.5 miles of roadway. This does not include the Petersville Road, which is a state road. The Alaska Department of Transportation and Public Facilities would construct the proposed road improvements using federal and state funds. Likewise maintenance of the road would be the responsibility of the state. The state of Alaska does not impose a general property tax. Local A fire service area would likely be established at Trapper Creek as part of providing fire and EMS services. This would result in a levy increase to local residents — probably in the range of 1.0 to 1.7 mills. Although, areawide support from the borough and special mitigation funds from state and federal sources as well as the private sector could reduce the levy requirement.

Trapper Creek Road Service Area property taxes would be expected to increase modestly, as road construction and maintenance needs would be driven by new commercial and residential development, which would also add to the service area property base. The Petersville Road would remain a state responsibility, with the possibility of federal financial assistance. Local property tax base increases associated with property appreciation could result in higher taxes unless levy rates are adjusted to offset such increases.

road service area impacts would result from increased commercial and residential development in the area and associated traffic volumes. Property tax revenues would also be expected to rise due to new construction and property appreciation.

There would be a potential increase in local tax burdens associated with the proposed action. As noted, EMS and education services are provided by the Matanuska-Susitna Borough on an area-wide basis (similar to planning, assessment and taxation, and parks and recreation). Augmented facilities and services for these services would be financed at the borough level. Thus, all residents of the borough would share the burden of financing the additional services required as a result of the proposed action. In addition, local residents could experience somewhat higher property taxes due to property appreciation associated with facilities improvements and stepped up economic activity in the Trapper Creek/ Petersville area. As a point of reference, the mill levy for the borough was set at 13.75 mills in FY 1996 which was substantially lower than in FY 1995 (15.78 mills) due to a reduction in debt service requirements.

Public revenues from property taxes (with the exception of those imposed for the benefit of service areas) and the 5% hotel tax would accrue to the Matanuska-Susitna Borough from increased private real property development and increased visitor lodging expenditure, respectively. These revenues would provide the Matanuska-Susitna Borough with added capability to fund more public services, as discussed, in the area.

Social Environment. Quality of life impacts on residents in the Matanuska-Susitna Borough would be determined by the magnitude of increases in development and visitor use in given areas. Those interested in economic improvement would find encouragement in the form of more jobs and earnings available locally. This would also reduce the need for commuting to jobs in other areas by local residents. While winter business opportunities

are also on the increase, most new employment opportunities would be in the summer. The Matanuska-Susitna Borough would perhaps attract other business and residential use to the area through improved land use planning. Development would be higher quality and better organized.

However, the desire for remoteness and a quiet rural atmosphere by many residents would not be supported by the proposed action. Those locating for this lifestyle reason would feel that encroaching urbanization with attendant issues of crowding, noise, increased tourism, and more intensive land use would be a degradation of the environment from their perspective. The primary reason many residents live in the south side area is to maintain a safe, rural, relatively self-sufficient lifestyle afforded by a remote location. Accordingly, privacy, seclusion, and opportunities for maintaining a rural lifestyle would be reduced under conditions of the proposed action. On the other hand, other residents would welcome improved access and expanded recreational opportunities as well as new business and employment opportunities stimulated by the proposed action.

Improving the Petersville Road would further facilitate other visitor uses in the lands surrounding the road, such as cross-country skiing, ORVs, and snowmachining. Residents

Conclusion

There would be direct and indirect benefits, mostly during summer, to Matanuska-Susitna Borough residents from improved road and park use facilities and employment and income-producing opportunities for local residents. Economic benefits would mostly accrue to residents within easy commute range or located at the sites of new facilities. There would be increased operation and maintenance costs for the improved facilities.

Population in-migration could occur as a result of increased demand for seasonal workers during construction and operations. In addition, there would be some increase in population due to private business expansion in the area as a

from south-central Alaska would benefit from access to the area particularly, although the area is already heavily used for winter activities. Increased snowmachine use would result in some additional noise and a further proliferation of trails, but it is difficult to estimate how much this would change from the no-action alternative. Conflicts between dog mushers and other winter users have been reported but are not anticipated to be widespread. Although, dog mushing training activities on summer trails might result in conflicts between visitors using the Petersville Road and local dog mushers, necessitating safety precautions. Improvements to the Petersville Road would enhance traffic safety generally.

Minority and Low Income Populations and Communities. The Department of the Interior's policy on environmental justice (Executive Order 12898) requires the National Park Service to evaluate the impacts on minority and low income populations and communities in the Matanuska-Susitna Borough. The impact on minority and low income populations and communities is likely to be positive, but insignificant, due to expanded opportunities for employment and earnings associated with the proposed action.

result of the proposed action. Housing for seasonal workers might be provided in camp-like facilities (such as cabins) or group facilities (such as dormitories, kitchen and dining halls, etc). Some housing might be available from the existing housing stock, but more likely there would be a need to develop additional employee housing. The Alaska Department of Transportation and Public Facilities does not directly provide construction worker housing. However, in outlying areas, contractors typically provide RV camps built to appropriate standards for use by road construction workers.

Adverse land use effects could occur unless certain land use actions are taken by the Matanuska-Susitna Borough and other transportation corridor protections are instituted

by the state of Alaska and the borough with the active participation of the local community. In addition, borough land disposal programs could include conveyance restrictions. Municipal service impacts would likely be adverse; ambulance and fire protection services would need to be upgraded and developed. Quality of life changes would be positive for those interested in increased availability of local jobs and earnings. For those interested in maintaining a sense of remoteness and a quite rural atmosphere, the perception may be of a degraded quality of life. Residents of south-central Alaska would benefit from improved access for recreational purposes.

TRAPPER CREEK AND PETERSVILLE ECONOMIES AND SOCIAL ENVIRONMENT

Analysis

The socioeconomic impacts of the proposed action on Trapper Creek and Petersville (including Peters Creek) were analyzed both quantitatively and qualitatively using techniques. Construction work at the Tokositna site and on the Petersville Road would provide both construction and service/trade employment and income to residents of Trapper Creek community since it is in the immediate vicinity of the work. Operations, especially at Tokositna, might also provide work and earnings for Trapper Creek community residents, since some jobs would be available as seasonal rangers, interpreters, building maintenance, road maintenance, and grounds maintenance occupations.

Petersville (including Peters Creek) is a small “community” spread along the Petersville Road 20–30 miles in from the George Parks Highway junction. Tourism and recreational activities are important activities in the area and suggest development of service/retail activities related to outdoor recreation and tourism use. Construction and operations, particularly on the Petersville Road and at the Tokositna site, would provide work for Petersville area

similar to those described for the Matanuska-Susitna Borough.

Trapper Creek is a small community near the intersection of the George Parks Highway and the Petersville Road. Trapper Creek has a limited economic base with most businesses considered retail and service. Many jobs are tourism-related, such as work in gasoline stations, restaurants, lodges, and grocery stores, and government work in schools, highways, and post offices. Dog mushing is also pursued for both commercial and personal recreation reasons. Seasonal work is also available in construction and mining. There is relatively little mining activity in the Petersville area currently, with perhaps a half dozen miners working three to four small mining operations in a given year. While existing surface mining is not likely to result in the discovery of new ore bearing deposits, the potential for substantial production of gold bearing ores is quite high from deeper channels lying in bedrock buried beneath glacial material. Thus, gold production could be increased substantially in the future.

residents in ways similar to those just discussed for Trapper Creek community residents.

The area along the Petersville Road has a relatively large number of vacation cabins and/or second homes. Trapper Creek, which is currently experiencing moderate growth in residential development, is especially well-positioned to receive in-migrating workers and their families associated with the proposed action.

Improvements to the Petersville Road and construction of park facilities at Tokositna would generate an estimated 277 direct and 196 indirect jobs. In addition, park operations would require 10 seasonal positions at Tokositna, and visitor use would generate a total of 161 jobs in the region by 2002. Although it is difficult to estimate how many of these positions would be filled by local residents, it is likely that some of the labor force would come from Trapper Creek and the area farther out on the Petersville Road.

There would also be spin-off economic benefits to other segments of their respective economies because of housing and subsistence requirements of the workers and expanded business opportunities to provide goods and services to visitors.

Overview of Socioeconomic Effects

Population and Housing. Population effects on the Trapper Creek and the Petersville area residents might include in-migration of construction workers and/or NPS and state seasonal workers during the construction and operations phases, respectively. Of course, local residents may also benefit from availability of such jobs and other (indirect/induced) work opportunities. Since housing appears to be tight and employees are unlikely to commute long distances, it is unlikely that the area housing market could absorb seasonal in-migrants, as discussed above for the Matanuska-Susitna Borough. Without provision of group housing, seasonal NPS and state workers at Tokositna

Land Use. Land uses on the south side would change to respond to additional visitor use in the area, including additional lodging, food service, and retail sales outlets, as well as associated employee housing and support development. The amount of this development that occurs in the Trapper Creek/Petersville area cannot be estimated, but would be located in a prime spot for additional development — at the main access intersection and along the road into the Tokositna development site. Land use actions to direct the type and pattern of development in these small communities would preserve a semblance of order in community growth. The Matanuska-Susitna Borough, with the active participation of the local community, would likely develop such protections, while at the same time ensuring that private economic opportunities are enhanced. The extensive amount of public land in the area offers the potential for protection of much of the road corridor if appropriate management plans are adopted and deed restrictions are included in land disposal activities. Corridor management planning for the Petersville area and Trapper

would likely find it difficult to obtain housing at reasonable cost during the prime recreation season. However, it is assumed that employee housing would be provided for some staff at the Tokositna site, and temporary housing for workers on Petersville Road construction projects would likely be provided by construction contractors.

Economy. Jobs and income-growth opportunities from construction and operations of new facilities and from visitor use would accrue to both Trapper Creek and Petersville residents. Expanded visitor services would likely be required in Trapper Creek at the junction of the Petersville Road and the George Parks Highway. This would have a positive economic impact. It is also likely that establishments providing visitor services at various locations on the Petersville Road, such as gasoline stations, bed and breakfast operations, and convenience stores, would be developed.

Creek community could promote orderly development, protect human and natural resources, and maximize benefits to the community from the proposed development.

There could be pressure to further regulate mining activities as recreational uses grow in this area. However, this plan assumes that mining activity would be compatible with increasing tourism in the area, and steps would be taken to minimize potential future conflicts. For example, the proposed Petersville Road upgrade and extension would consider the interest of local claim holders.

Mining interpretation could be a tourism attraction in the area, and commercial recreation mining opportunities may be provided by the state.

There are numerous mining claims filed on state selections along the Petersville Road that will become valid upon land conveyance from the federal government. State land management plans and policies will support the maintenance

of mining activities and will provide direction on measures to avoid conflicts with other land uses. As discussed in more detail in the “Affected Environment” chapter, the state is also formulating a leasehold location order for certain lands adjacent to the Petersville Road and its extension.

Municipal Services. Fire protection, ambulance service, and local roads would likely require upgrading in these communities to accommodate growth and to provide new facilities with adequate protection and coverage. Fire protection is a service-area function and would be funded by local property taxes. Ambulance service is a Matanuska-Susitna Borough areawide function and is funded out of general property taxes collected by the borough. The Trapper Creek Road Service Area is funded out of local property taxes. Property and hotel/motel tax revenues would accrue to the area and borough from increased private real property values and increased visitor lodging. Details of the impact analysis in regard to these services are presented in the discussion of impacts of the proposed action on the Matanuska-Susitna Borough.

Social Environment. Quality of life impacts due to development would include increased opportunities for those seeking jobs and income. The need for commuting to jobs in other areas would be reduced, although these would be primarily seasonal jobs. Development would be more orderly and up to higher standards.

Conclusion

Local Trapper Creek and Petersville residents would benefit from better park facilities and enhanced economic opportunities. Population in-migration would increase due to the employment of seasonal construction workers and seasonal and permanent operations workers. Most of the impacts would be seasonal, i.e., three to four months during the summer peak. During construction, housing shortages would require the provision of group housing or camp-like facilities, such as cabins or an RV campground. Other impacts include the potential for increased demand for municipal

However, many residents of the Trapper Creek and Petersville areas have moved there for reasons other than conventional employment opportunities. Some residents, such as miners, trappers, guides, and others who have chosen to live in the area because of its remoteness and natural qualities, are more interested in maintaining a safe, rural, relatively self-sufficient lifestyle afforded by remote living areas. They may view road and visitor center development as encroaching urbanization, which they wished to leave behind when they moved to the area. Privacy, seclusion, and opportunities for maintaining a rural lifestyle would all be reduced.

Nonetheless, in a May 1995 opinion poll of persons attending a town meeting in Trapper Creek, 82% of those polled were in favor of the proposed Tokositna visitor center. It should be noted that this was not a scientific survey, and the results cannot be extrapolated to the community at large, but it is an indicator of some local support at that time in the planning process.

Improving the Petersville Road would further facilitate other visitor uses of the lands surrounding the road. These impacts were discussed above under the social environment section for Matanuska-Susitna Borough.

facilities and services, especially ambulance and fire services; and loss of the sense of remoteness and natural qualities as well as the rural community atmosphere that represent the primary reasons why many have chosen to reside in or visit the area.

TALKEETNA ECONOMY AND SOCIAL ENVIRONMENT

Analysis

The socioeconomic impacts of the proposed action on Talkeetna were analyzed

quantitatively using techniques similar to those described for the Matanuska-Susitna Borough.

The Talkeetna economy is driven by employment and earnings from tourism-related industries including transportation, communication, trade, services, and government. Talkeetna is a small town 13 miles up the Talkeetna spur road from the junction of the George Parks Highway. The town lies at the confluence of the Talkeetna and Susitna Rivers. Talkeetna is the traditional staging area and departure point for Mount McKinley mountaineering expeditions.

It is possible that the proposed Tokositna visitor center and the Petersville Road developments would draw from the Talkeetna labor force for construction and operations.

Overview of Socioeconomic Effects

Population and Housing. Population relocation effects on Talkeetna are unlikely to be substantial under the proposed action since most effort would focus on the Petersville Road and Tokositna development. Some local residents would obtain employment. Housing impacts would be minimal.

Economy. Some jobs and income-growth opportunities from construction and operations
Conclusion

Overall, since no south side facilities are proposed for Talkeetna, adverse impacts would be minimal and concentrated during the summer. Talkeetna residents would experience additional job and income-producing opportunities associated with general regional increases in visitation under the proposed action, mostly during summer. Municipal services would be impacted slightly. Minimal impacts would be expected on land use and quality of life. Along with baseline growth, some increased summer traffic and pedestrian congestion at private and public facilities would likely result.

of new facilities and from visitor use would flow to Talkeetna residents.

Land Use. There would be no major land use impacts on Talkeetna because there would be no facility development in the community under the proposed action. However, some additional growth in visitor use in the south side area could cause pressure for additional retail business, but it is expected that existing businesses would accommodate the anticipated need.

Municipal Services. The relatively small amount of incremental visitation, economic activity, and related use due to the proposed action would not likely generate substantial demand for community services in Talkeetna.

Social Environment. Quality of life impacts resulting from the proposed action would be perceived as positive by persons seeking jobs and income. However, many of Talkeetna's residents have moved there for reasons other than conventional employment opportunities. Some residents are more interested in maintaining a safe, rural, relatively self-sufficient lifestyle afforded by remote living areas. They may view the Petersville Road and visitor center developments at Tokositna as encroaching urbanization, which they wished to leave behind when they moved to the area.

DENALI BOROUGH ECONOMY AND SOCIAL ENVIRONMENT

Analysis

The socioeconomic impacts of the proposed action on the Denali Borough were analyzed quantitatively using techniques similar to those described for the Matanuska-Susitna Borough.

Based on the official NPS data (National Park Service, monthly public use reports), recreation visits at Denali National Park and Preserve has not increased; it has slightly declined over the past five years and has not increased over the past 10 years. Recent NPS analysis of these

trends indicates that these figures may not be accurate. However, the more recent five years has been a period of rapid growth in non-Alaska resident tourism. This pattern suggests that the north side of Denali National Park and Preserve is being used at its maximum effective capacity under current physical conditions and park management policies. Because the north side of the park is in Denali Borough and has the largest impact on the local economy, limited visitation is a source of concern for the borough. Development of the proposed facilities under the proposed action, such as a small visitor center in Denali State Park and improved access to the Dunkle Hills, might result in some spill-over economic benefits to Denali Borough. The fact that Denali State Park is located 40 miles south of Denali Borough suggests that only a few of the jobs created at the visitor center and related private visitor facilities might go to residents of the Denali Borough, especially residents of Cantwell. There would be no significant impacts on the borough population or housing.

The Denali Borough currently does not impose land use controls such as zoning or subdivision ordinances. The lack of land use controls could be detrimental to the human and natural resources in area, especially if private sector development occurs within nearby major transportation corridors (i.e., George Parks). Some small, but important long-term regional employment opportunities would be created in the Denali Borough as a result of additional use and development on the south side of Denali, such as the small visitor center in Denali State Park and improved access to the Dunkle Hills. Some indirect economic benefits would be likely for merchants supplying goods and services to visitors in the area. There would be increased traffic and economic activity associated with tourism, with associated impacts on the rural community lifestyle. Most of the impacts would be seasonal, i.e., three to four months during the summer. Land use and community services impacts would likely be minimal. Similarly, quality of life impacts would probably be minimal.

Highway and Denali Highway). No effort similar to the Matanuska-Susitna Borough corridor planning has been instituted, and it is uncertain when such a program might be established. A similar program could help protect the resources of the highway corridor.

There would be minimal impacts from the proposed action on the social environment of the Denali Borough. Overall quality of life would be improved slightly as a result of increased employment and earnings opportunities. Some residents of the borough might perceive any tourism-related development as a negative impact.

The Department of the Interior's policy on environmental justice (EO 12898) requires the National Park Service to evaluate the impacts on minority and low income populations and communities in the Denali Borough. The impact on minority and low income populations and communities is likely to be positive, but insignificant, due to expanded opportunities for employment and earnings associated with the proposed action.

Conclusion

CANTWELL ECONOMY AND SOCIAL ENVIRONMENT

Analysis

The socioeconomic impacts of the proposed action on the Cantwell community were analyzed quantitatively using techniques similar to those described for Matanuska-Susitna Borough.

The development of a small visitor center in Denali State Park would generate some jobs and earnings for regional residents. Possibly some of these might be Cantwell residents. Cantwell is about 40 miles from Denali State Park and is a small town of under 200 people that has

recently experienced rapid job and population growth owing to workforce expansion in transportation operations and maintenance activities. This suggests a “boomtown” situation with a tight labor market. The overall socioeconomic impacts to Cantwell under the proposed action, including impacts on population, housing, land use, community services, and quality of life, are anticipated to be negligible.

Conclusion

Minimal socioeconomic impacts would be anticipated in the Cantwell area from the proposed action, mostly because of the relatively long distances between the community and Denali State Park. Population and housing impacts on Cantwell would be minimal. Some small, but relatively important employment opportunities would be created as a result of additional use and development in other areas of the south side, such as the small visitor center along the George Parks Highway in Denali State Park. Some indirect effects could occur as a result of increased visitor expenditures as visitors pass through the Cantwell area on their way to other destinations. Most of the impacts would be seasonal, i.e., Visitor use, specifically on the south side of the Alaska Range, is difficult to estimate since there are multiple points of access. Backcountry use permits are not required for this area of the park except for climbers on Mount McKinley. Foot access to national park lands, although possible, is extremely limited and difficult because of major rivers and the distance from roads to the park boundary. Private aircraft operate along the south side on scenic flights, mostly out of Talkeetna, but relatively few private aircraft land on park lands because of weather, topography, and glacial/snow conditions. And while flightseeing is expected to continue to increase, the proposed action would likely not accelerate this increase. This is because visitors to the south side would have less expensive alternative activities at Tokositna.

three to four months during the summer peak, not year-round. Land use and community services impacts would probably be minimal. Similarly, quality of life impacts would probably be negligible.

VISITOR USE - DENALI STATE PARK AND DENALI NATIONAL PARK AND PRESERVE

Analysis

In order to assess the effects of the proposed action on visitor use, the various opportunities for visitor activity, education, and enjoyment were compared to opportunities currently available.

Visitor Activities. Proposed actions would provide opportunities for enhancing the Denali National Park and Preserve and Denali State Park visits. Greater numbers of regional Alaska residents and other independent travelers would be attracted by recreational opportunities in south side Denali areas. Most of these would arrive in automobiles, light trucks, and RVs.

Over the long term, the visitor centers and associated facilities, hotel developments, short interpretive/hiking trails, public use cabins, and campgrounds would increase recreational opportunities throughout the south side. Additional winter access and parking would be available on the Petersville Road and would attract some increased numbers of visitors, particularly snowmobilers. The increased snowmobile use would occur primarily on state lands. Trails at the end of the road might also make it more attractive for mountain climbers to undertake weekend trips into this portion of the range.

Interpretation. At present there are no publicly operated visitor centers between Anchorage and the north side of Denali National Park and Preserve and few interpretive exhibits. Some information is available in state-run facilities in

Denali State Park. Under the proposed action visitor centers would be established at Tokositna and in the central development zone; in addition, roadside exhibits would be placed along the George Parks Highway.

Several hundred thousand visitors travel the George Parks Highway between June and September of each year. Virtually all first-time visitors to the area would be expected to stop at a small visitor center and at least some of the roadside exhibits on the George Parks Highway. Many would turn off the highway at Trapper Creek and proceed to the Tokositna visitor center. These facilities would provide the opportunity to enhance every first-time visitor's understanding and appreciation for the natural features and cultural history of the south side of Denali National Park and Preserve, including lands within the state park and elsewhere in the area. Developing a 5,000-square-foot visitor center at Tokositna and a 3,000-square-foot visitor center in the central development zone would ensure that educational and interpretive opportunities would be provided.

Visitor Experience. At Tokositna, outdoor-oriented interpretation would be emphasized. There is considerable interest in learning about nature, including geology (glaciers, terrain, mountains); animals (especially large animals such as bear, moose, and caribou); vegetation (trees, shrubs, moss, berries, etc.); and fish (salmon, trout). Most of these are abundant in the Tokositna region. Visitors would experience Opportunities for visitation to the south side would be enhanced and expanded due to development of a visitor center at Tokositna. Campgrounds, public use cabins, nature trails, hiking trails, roadside attractions, and other day use facilities would also add to the south side experience of the state and national parks. First-time visitors, those traveling in organized tours or as family groups, and Alaskans would be provided increased recreational and interpretive opportunities.

There would likely be increased development activity on private lands, especially along the first few miles of the Petersville Road, as a

the wild character and natural features by viewing some of the most spectacular topography in Denali National Park and Preserve at close range. Some visitors would participate more directly in activities oriented to a backcountry experience. Public use cabin and camping opportunities would be available as would short nature trail and longer hiking trail experiences. A fly-in experience would be available to some visitors at Chelatna Lake.

The Tokositna site has the greatest potential for meeting expanding visitation demand for Denali National Park and Preserve. A visitor center would serve as an alternate destination and help direct future visitation and travel to the south side of Denali National Park and Preserve. Tokositna would provide an option for users to access state and national park lands in a natural alpine settings off the main highway yet much closer to Anchorage and Seward than the north side.

Additional hunting and fishing pressure in the area resulting from improved access could result in conflicts with other visitor groups, possibly leading to adjustments in seasons and bag or catch limits through the Alaska Boards of Game and Fisheries (see more detailed discussion on cumulative impacts on subsistence).

Conclusion

result of the proposed action, and this could impact the visual and aesthetic quality of a portion of the road corridor. Upgrading the Petersville Road improve access and result in increases in other recreational uses, although the road would not be maintained past the Forks Roadhouse in winter. Residents from south-central Alaska would benefit from improved access to the area particularly. There would be increased noise associated with increased snowmachine use in the area, although it is difficult to estimate how much this would increase beyond baseline growth. Indeed, improved access may lead to increased hunting competition and management modification,

such as restrictions on season length and bag or catch limits.

IMPACTS IF NO LAND USE CONTROLS ARE IMPLEMENTED: PROPOSED ACTION

As noted, the preceding analysis was based on the assumption that land use controls and other actions to minimize potentially adverse impacts on the south side would be adopted and implemented prior to initiating the major development associated with the proposed action (see the “Elements Common to All Action Alternatives” section). If land use controls were not implemented, the potential for spin-off development (i.e., development indirectly stemming from the proposed action such as new hotels, gas stations, and general stores) would be greater than described above. This is because there likely would be fewer restrictions on the type and extent of development allowed on the south side, particularly along the road corridors. Additionally, there would probably be less management attention specifically focused on the Petersville Road corridor and on activities and land uses adjacent to the corridor.

More spin-off development would lead to greater impacts on natural and socioeconomic values than described in the preceding analysis. This development would result in an increased loss of wildlife and fish habitat either directly due to construction of the facilities themselves or indirectly due to displacement of wildlife. However, substantial spin-off development could occur on lands along the first 19 miles of the Petersville Road, as well as along the George Parks Highway. This, in turn, could lead to substantial impacts on natural and socioeconomic resources in the area.

The proposed development would attract some additional recreationists (e.g., snowmachiners, boaters, skiers, and dogsledders) to the south side, particularly in the Tokositna area. However, the preceding analysis assumes land managers would work together to manage these

from habitat as a result of increased human use and noise. Development and use would also increase the potential for adverse effects on air and water quality, both in the short term (e.g., increasing dust levels and alteration of water flow) and the long-term (e.g., polluting local air quality and increasing sedimentation in streams).

In terms of socioeconomic resources, some types of spin-off development could cause greater impacts to the rural character of the road corridor from Trapper Creek to the Tokositna site. This would be particularly the case for the section of the Petersville Road between the George Parks Highway and Forks Roadhouse. This could diminish the experience and enjoyment of the natural features of the area by both visitors and some local residents and, thus, reduce the desirability of the area for these groups.

The magnitude of these impacts on natural and socioeconomic resources would be dependent on the extent of spin-off development on the south side. Other than mining activities, no private developments would occur along the Petersville Road past the Forks Roadhouse, since this area is entirely state owned and managed for retention in state ownership according to the *Susitna Area Plan*. The *Susitna Area Plan* would likely be modified to prohibit additional land disposals along the Petersville Road between the George Parks Highway and mile 19 (Forks Roadhouse).

uses so as to minimize conflict between user groups and avoid other adverse impacts. If such cooperative efforts were not made then recreational use in the area likely would be dealt with in a more piecemeal fashion, with management less of a priority for land managers. As a result, there would probably be more frequent conflicts between the diverse user groups.

CUMULATIVE IMPACTS

Cumulative impacts are defined as the *incremental impacts* on the environment resulting from adding the proposed action to other past, present, and reasonably foreseeable future actions (also referred to as regional actions), including those taken by both federal and nonfederal agencies, as well as actions undertaken by individuals. Cumulative impacts may result from singularly minor but collectively significant actions taking place over a period of time (CEQ Sec 1508.7).

For this cumulative case analysis, information was gathered on commercial and private development, land disposals, transportation modes, subsistence activities, mining, forestry, and recreational activities, excepting the proposed action, that have or are occurring on the south side, or that may reasonably be expected to occur within the next 20 years. The cumulative (incremental) impacts of adding the proposed action to these other actions were then determined for environmental impact topics.

Past, Present, and Reasonably Foreseeable Actions on the South Side

Commercial and Private Development. Land on the south side falls into several ownership categories: state, federal, borough (Denali and Matanuska-Susitna Boroughs), Native corporations (Ahtna, Inc., and Cook Inlet Region, Inc.), and private, with the vast *Settlement and homebuilding* — Settlement and home building have proceeded steadily in the more accessible areas of the south side near the George Parks Highway and along the Petersville and Talkeetna spur roads, particularly near the communities of Talkeetna, Trapper Creek, and Cantwell. Several subdivisions have been developed along the shores of lakes and streams within the highway corridor. In the more remote areas of the south side, development is limited primarily to privately owned cabins and the occasional small commercial lodge.

A patent is forthcoming from the state of Alaska to Matanuska-Susitna Borough for 100 acres north of the Petersville Road and partially

majority owned by the state of Alaska. Most of the federally managed land on the south side is in Denali National Park and Preserve. There are numerous mining claims filed on state selections along the Petersville Road that would become valid upon land conveyance from the federal government. State land management plans and policies would support the maintenance of mining activities. Borough lands generally fall close to the main travel corridors, primarily along the George Parks Highway. Cook Inlet Region, Inc. lands within the south side study area are in the Matanuska-Susitna Borough, in the vicinity of Talkeetna. Currently Ahtna, Inc. lands in the study area fall within both the Matanuska-Susitna Borough and Denali Borough, in the vicinity of Broad Pass and Cantwell. However, Ahtna, Inc. has expressed an interest in having some of its lands in the northeast section of the Matanuska-Susitna Borough become part of the Denali Borough. According to Denali Borough's *Comprehensive Land Use Plan* (July 1995), Ahtna, Inc. officials believe their corporation has more in common with residents of the Denali Borough than the Matanuska-Susitna Borough. In addition, the corporation intends to develop its lands and the current tax structure and land use actions in the Denali Borough are viewed more favorably than those in the Matanuska-Susitna Borough. There are no indications that this boundary change would be made.

touching the George Parks Highway. About 60 acres of this may be conveyed to the Trapper Creek Community Services Association for a park, a ballfield, and ski trails. The balance would be retained by the borough for future community uses (e.g., firehall, emergency services, solid waste transfer station).

The Matanuska Electric Association has requested from the Matanuska-Susitna Borough an electrical distribution easement parallel to the scenic buffer north of Trapper Creek to the new hotel site at mile 133 in Denali State Park (see below). This line is anticipated to increase interest in developing borough-owned lands

accessible to the George Parks Highway when power is available.

Visitor facilities — Following trends in Alaska tourism visitation (5.5% per annum between 1985 and 1995), baseline growth in south side tourism is expected to be substantial during the near future. Visitation in Denali State Park specifically would be expected to continue past trends of about 3.5% growth per year. Construction of major visitor facilities such as hotels has been minimal in the past, but is expected to increase in the near future as the tourist industry begins to promote the south side more. For example, improvements in visitor services are being considered in a new plan for the frontcountry area of Denali National Park and Preserve, and overnight lodging capacity near the national park entrance on the north side has increased (following recent historical trends in the development of hotel/motel capacity). Additionally, potential future improvements in road access to or within Denali National Park and Preserve and Denali State Park are being considered.

To meet the needs of increased tourists, particularly package tour visitors, a 320-pillow capacity hotel will be opened on privately owned land near mile 133 on the George Parks Highway just south of Denali State Park. About 23–25 acres of the 146-acre site will be developed for this facility (Nelson 1995). Princess Tours expects to transport about 160 people per day each way between the Talkeetna

Land Disposals. The Alaska Department of Natural Resources has a land disposal program designed to transfer settlement and recreation land directly to the public. In 1996 the department suspended its land disposal program indefinitely due to budget cuts. The emphasis of the program over the next several years would be limited to offering parcels that have previously been available for disposal but have either never been sold or have returned to state ownership (foreclosure, relinquishment, etc.). The Department of Natural Resources has identified about 5,000 such parcels throughout Alaska.

rail stop and the hotel in summer 1997. Although no official proposals have been put forth, other hotels may be built in the near future along the George Parks Highway south of the state park.

Other resort lodges, motels, RV parks, cabins, and campgrounds would likely be developed in the region independent of developments considered under the proposed action.

Ongoing development of tourist facilities would generate the need for additional recreation/tourism facilities, including access roads, turnouts, parking areas, and sanitation facilities, trailheads, trails, campgrounds, and cabins.

Healy power plant — Construction began in 1995 on a state-of-the-art coal-fired power plant near Healy in the Denali Borough. Though this facility is outside the south side study area, it is within the region of influence. The \$242 million project is being constructed over a four-year period with a peak construction work force reported at about 300 workers.

Clear Air Force Base — The future of this facility, the second largest employer in Denali Borough and located in the city of Anderson, is uncertain. The base could be downsized or closed under agreements negotiated as part of the Start Treaty with Russia.

In late 1995, the Department of Natural Resources offered a 35-acre road-frontage parcel at mile 2.2 of the Petersville Road through lottery drawing. It was the most popular parcel in the entire 300+ parcel statewide sale, attracting 447 applications and demonstrating strong demand for road-accessible land in the south Denali region.

Several areas are identified by the *Susitna Area Plan* for disposal, including Schneider Lake, Kroto Creek, Tokosha, Gate Creek, and Amber Lake. Any land disposal in the area would be set back from the Petersville Road to protect scenic qualities.

About 600 acres of land west of the George Parks Highway and north of the Petersville Road are being considered for disposal by the Matanuska-Susitna Borough in low density 40-acre settlement parcels. The target date for this program is one to three years.

Transportation Modes. The major modes of ground transportation to and within the south side are trains and motor vehicles. Princess Tours, Holland-America, and other tourist companies market package tours within Alaska that include travel on the Alaska Railroad through the south side, with Talkeetna the major stop in the area. In the future, the Alaska Railroad and the major cruise ship lines might alter the way package tour visitors access the south side. A new rail station could be established near the George Parks Highway in the south side area. Nonetheless, current plans call for establishing a new railroad depot at Talkeetna about three-quarters of a mile from the center of the town.

The Denali Highway provides a connecting route between Fairbanks and Wrangell-St. Elias National Park and Preserve; traffic along this road could increase in the future as visitors become more aware of this connection.

Highway traffic through the south side is moderate and free-flowing. Recent Alaska Department of Transportation and Public Facilities data on average daily traffic (ADT) in both directions was obtained for the George Parks Highway near Byers Lake and at Existing mining activity in the Petersville area, which emphasizes surface mining, is not likely to result in the discovery of new ore bearing deposits. However, the potential for substantial production of gold bearing ores is quite high from deeper channels lying in bedrock buried beneath glacial material. As a rule of thumb applied by mineralogists the prior existence of minerals suggests that more are likely to be found. Usually a geologist will reason that it is highly likely to find placer gold where such mines have previously existed. This suggests

crossings and intersections near the Petersville Road. At Byers Lake, ADT on the George Parks Highway was 1,200 in 1995, 980 in 1993, and 821 in 1990. In 1995, the ADT on the highway at Trapper Creek, near the junction with the Petersville Road, was 1,285 vehicles per day, an increase from 1,000 in 1993, and from 1,020 in 1990. Traffic on the Petersville Road in 1995 was 200 vehicles per day at the junction with George Parks Highway and 110 vehicles per day at a point on the paved section of the road 2 to 3 miles from the junction with the highway. Most vehicles enter the Petersville Road for relatively short trips. ADT counts are calculated over an entire year; if traffic flows were considered during the summer season only, the ADT during these months could be twice as high. In addition to road traffic, ATV use throughout the south side is heavy, as many people use ATVs to access remote cabins.

Mining. Active and inactive placer gold mining claim areas are extensive in the Peters and Dutch Hills drainages of Cache, Dutch, and Peters Creeks. To the north are extensive mining claims in the areas of Ohio Creek, the West Fork of the Chulitna River, and in the small communities of Honolulu and Colorado, on which there has been minimal past activity. On the south side and within the boundaries of Denali National Park and Preserve, there are about 3,900 acres of patented mining claims, unpatented lode claims, and unpatented placer claims.

that mining would continue in the Peter and Dutch Hills area for the foreseeable future.

As of January 1996, there were 203 state mining claims on state-selected and state-patented lands from the Forks Roadhouse to the Denali State Park boundary in the upper Peters Creek drainage. This portion of the Yentna Mining District has seen continuous mining activity since the discovery of gold on Dollar Creek in the early 1900s. There are numerous claim conflicts that involve over-staking by multiple claim owners in the Peters Creek drainage and

its tributaries. Three federal mineral surveys composed of 123 federal mining claims located in the upper Peters Creek drainage have been declared abandoned by the Bureau of Land Management, and a state land selection has attached to these federal lands. The state of Alaska has asked for conveyance of the area and is working on a leasehold location for portions of the road corridor to maintain opportunities for road upgrade.

The Division of Mining and Water Management (Alaska Department of Natural Resources) identified two areas within the federal mineral surveys that may be developed for recreational mining (e.g., small-scale private gold panning), and has closed them to mineral entry.

Mining interpretation in the Petersville area could become a tourism drawing card. Other locations in Alaska have done so successfully. For example, the Crow Creek Mine south of Anchorage attracts about 35,000 tourists who engage in panning for gold. The state of Alaska recently established a Gold Rush Taskforce with participation by state agencies involved with tourism for the purpose of commemorating the theme and stimulating interest in the centennial celebration of the historic Gold Rush.

Over the long term, the Golden Zone mine in the Dunkle Hills is expected to produce significant quantities of gold and other minerals. Operators may make incremental improvements in the state right-of-way to make vehicular and foot access easier. In addition, they are contemplating interpretive activities associated with active mining at this location.

Another major group of recreationists consists of snowmachiners and cross-country skiers. Based on a 40 weekend day winter season and an average of 150 persons per weekend day (with a one-day stay), this group contributes about 6,000 person visits per year. On one weekend day in December, an estimated 350 vehicles pulling snowmobile trailers (each trailer capable of carrying at least two machines) were counted on the Petersville Road (NPS 1996a). A three-day flyover in April 1996

Forestry. From mile 110 of the George Parks Highway north, the Matanuska-Susitna Borough has thousands of acres designated for forest management. In a 5,000-acre area from mile 118 to 128, three timber contracts are active today east of the highway and one west of the highway. From mile 110 to 118, about 3,000 acres are approved for timber sales with three active contracts in process. Along the Petersville Road, one timber sale along mile 3 to 5 is active with areas approved for future contracts. Additional timber sales are expected in these areas within the next five years, including the Chulitna River Basin (due to spruce bark beetle infestation).

Recreational Activities. Several recreational activities take place on the south side, including river rafting and boating, snowmachining, skiing, hiking, fishing, and hunting. Most south side visitors use commercial operators for access and to guide them once there. People experiencing the rugged backcountry frequently rely on a guide (see socioeconomic section for additional information).

River rafting and boating, including guided trips, occur on many of the south side rivers and streams, including the Chulitna River, Tokositna River, Lake Creek, Kroto Creek, and Moose Creek. Data on river use for the Droshky River system suggests a total of about 12,600 person visits per year (see socioeconomic section for additional information). Both commercial river rafting and boating are likely to increase, particularly as a result of hotel development in the area.

found snowmachine tracks throughout the south side, including tracks along Cache and Peters Creeks, up the Tokositna River drainage to the base of the Tokositna and Kanikula Glaciers, up to 4,000 feet elevation in the Dutch Hills, along Dutch and Bear Creeks, all along and out from the Petersville Road, radiating out from Fairview Mountain, at Chelatna Lake and inside the national park at Snowslide Creek, and in the Kahiltna River drainage (NPS 1996b).

Flightseeing and landings by fixed wing and rotor aircraft could increase in the south side area. Additional flightseeing trips originating from Talkeetna or elsewhere could result in significant noise impacts on local residents and others, particularly those near flight paths used by aircraft making such trips. The National Park Service or state agencies would have no control over helicopter and other aircraft *flights* within the airspace over the state and national parks. The Federal Aviation Administration (FAA) has regulatory authority over airspace classification and use within the territorial limits of the U.S.

However, both the state and the National Park Service have complete regulatory authority over aircraft *landings* within their respective management boundaries. In September 1996, the state Division of Parks and Outdoor Recreation adopted new aircraft regulations regarding aircraft landings in Denali State Park. Fixed-wing landings would be prohibited east of the George Parks Highway, except on Blair and Ermine lakes; practice landings are prohibited throughout the park; and helicopter landings are allowed only by commercial use permit and only at five locations — Eldridge Knob, Quill Hill, the gravel bar located at the base of the Eldridge Glacier, the gravel bar at the confluence of the Fountain and Chulitna Rivers, and the gravel bar located at the base of the Ruth Glacier.

The level of backpacking and hiking on the south side is difficult to estimate because there are multiple points of access. Backcountry use permits are not required for this area except for climbers on Mount McKinley. Foot access is Commercial and private development, mining, and forestry activities would continue to result in the loss of several thousand acres of mixed and deciduous forest and smaller areas of grass, tall and low shrub, and riparian/wetland vegetation on the south side. People engaged in recreational activities such as hiking, fishing, and camping have also contributed to vegetation loss by creating social trails, trampling streamside vegetation, and denuding the ground of vegetation around campsites and picnic areas. The extent of these impacts has primarily been

extremely limited and difficult because of the terrain and minimal number of roads and trails.

Fishing and hunting on the south side are popular. The numerous surface waters provide habitat for the migration, spawning, and rearing of a variety of fish species, such as salmon, rainbow trout, Arctic grayling, northern pike, burbot, and whitefish (see “Fish” section of the “Affected Environment” chapter). Seven species of large mammals (moose, caribou, Dall sheep, wolf, wolverine, black and brown bear) are hunted on the south side, and a variety of small mammals and birds are also hunted, including red fox, lynx, beaver, marten, muskrat, mink, snowshoe hare, spruce grouse, three species of ptarmigan, and 15 kinds of ducks and geese. Recent total harvest statistics for the 1993–94 season for moose, black bear, and grizzly are provided below (ADFG 1995c).

GMSU	Grizzly	Black Bear	Moose
13E	31	25	239
14B	3	10	31
16A	2	44	98
16B	38	70	176

Grizzly harvests in the four subunits represent 5% of the total number harvested in the state of Alaska during the 1993–94 season; black bear harvests represent 10% of the total number statewide; and moose harvests represent 7% of the total number statewide.

Cumulative Impacts on Vegetation

limited to areas near major access roads such as the George Parks Highway and the Petersville Road. ATV tracks accessing private homesites and small commercial developments on the south side are numerous and have caused an unknown amount of rutting, erosion, and loss of vegetation.

The proposed action would add slightly to the vegetation impacts of the other regional actions described above. If the proposed action were implemented, an additional 143 to 217 acres of

vegetation would be lost directly due to the siting of new developments on the south side. Increased human use of the south side associated with these new facilities, particularly recreational use, would also contribute to the loss of vegetation; the extent of these impacts would be greater than under current conditions, as human access throughout the south side would be improved.

The incremental impacts of the proposed action represent a level of vegetation loss that is less than that which has or will occur as a result of the other regional actions. Overall, there would be no anticipated major cumulative impact on vegetation classes on the south side resulting from adding the proposed action to other regional actions, as all vegetation classes are common, extending across millions of acres.

Cumulative Impacts on Bears

All of the past, present, and future actions described earlier have had or will have at least some impact on bears on the south side. Commercial and private development, mining, forestry, and recreational activities have resulted in the loss of several thousand acres of grizzly and black bear habitat. Habitat loss can result directly due to the activity itself or indirectly when bears are displaced from habitat due to human use associated with the activity. Human use associated with development and recreation has also led to human/bear confrontations and harassment. For example, given the relatively low human use levels, several conflicts between bears and people have occurred on the south side in the past few years, including attacks, bluff-charges, and bears “lingering” around backpackers camps and campgrounds trying to get human food or garbage. There have been at The incremental impacts of the proposed action represent a level of habitat loss and disturbance less than that which has or will occur as a result of the other regional actions. Overall, no significant cumulative impacts on bears would be expected from adding the proposed action to other regional actions, as there are at least a million acres of bear habitat available on the

least three reports of people harassing bears via snowmachine in the past three years.

Bear mortality from “defense of life and property” situations, hunting, and poaching has also resulted from development and human use on the south side. An average of one to two bears have been killed in defense of life and property on the south side in the past ten years (Alaska State Troopers 1996). Grizzly and black bear hunting has adversely impacted individual bears, although the overall effects on grizzly populations on the south side has not been determined. Two grizzlies have been poached in the Tokositna River drainage since 1992.

Bears are occasionally killed by vehicles along the road system. An average of one to two black bears per year have also been killed by vehicles along the stretch of the George Parks Highway between Talkeetna and Cantwell (Alaska State Troopers 1996).

Impacts of the proposed action would add to the impacts of other regional actions discussed above. If the proposed action were implemented, an additional 143 to 217 acres of grizzly and black bear habitat would be lost, including 127 to 167 acres of prime grizzly habitat. An unknown amount of additional habitat could also be lost by bears being displaced from areas of use by human development or activities. Facilities developed under the proposed action would result in an increased human presence across a more extensive portion of the south side than under current conditions. This increased human use could, in turn, lead to more frequent bear/human confrontations and contribute to higher levels of bear mortality, adversely impacting individual bears, but not significantly impacting regional bear populations. south side and measures would be taken under the proposed action to minimize other disturbance- and mortality-related impacts.

Cumulative Impacts on Caribou

Commercial and private development, mining, and recreational activities on the south side have resulted in the loss of several hundred acres of caribou habitat, primarily in the Broad Pass/Cantwell area. Habitat loss can result directly due to the activity itself or indirectly when caribou are displaced from habitat due to human use associated with the activity. Hunting also has and will continue to adversely impact individual caribou.

Impacts of the proposed action would add minimally to the impacts of other regional actions discussed above. Use of the state-owned Dunkle Hills road to provide access into the Dunkle Hills/Broad Pass area for hiking, biking, and mining-related interpretation would probably have only minimum impacts on caribou at current population levels. Improved access along the Dunkle Hills road would increase nonsubsistence and subsistence hunting pressure in this area, which is currently lightly hunted. Increased human use, in general, could lead to more frequent incidents of caribou harassment, resulting in stress to individual animals, but no long-term impacts on populations would be expected. At historic population levels, however, with large numbers of animals using the Cantwell calving grounds, a concurrent increase in human use of the area could raise the potential for human/caribou interactions, thus increasing the frequency of disturbance by humans. Management actions could minimize or prevent these impacts.

The incremental impacts of the proposed action represent a level of habitat loss and disturbance less than that which has or will occur as a result of the other regional actions. Overall, no significant cumulative impacts on caribou

Impacts of the proposed action would add to the impacts of other regional actions discussed above. If the proposed action were implemented, an additional 143-217 acres of moose habitat would be lost, including 122 to 162 acres of critical winter habitat. An unknown amount of additional habitat could also be lost by moose being displaced from areas of use by human development or activities. Facilities developed under the proposed action would result in an increased human presence across a

would be anticipated to result from adding the proposed action to other regional actions, as there are several thousand acres of caribou habitat on the south side, and measures would be taken under the proposed action to minimize other disturbance-related impacts.

Cumulative Impacts on Moose

Commercial and private development, mining, and recreational activities on the south side have resulted in the loss of several thousand acres of moose habitat. Habitat loss can result directly due to the activity itself or indirectly when moose are displaced from habitat due to human use associated with the activity. Moose mortality has also resulted from development and human use on the south side. Since 1992, seven moose have been killed on the south side in defense of life and property (AST 1996). Moose are often killed by trains on the Alaska Railroad and by vehicles along the road system, especially in years of heavy snow accumulation when these animals travel along the rail tracks and roads to avoid deep snow. Trains have killed about 55 moose between Talkeetna and Cantwell since 1992 (AST 1995). Additionally, since 1992, 50 moose have been killed by motor vehicles on the section of highway between Talkeetna and Cantwell (AST 1995). Hunting also has and will continue to adversely impact individual moose.

Development and human activity around Talkeetna has also probably affected moose distribution and use in local wintering areas to a moderate degree.

more extensive portion of the south side than under current conditions. Improved access along the Petersville Road could increase hunting pressure in this area which is already heavily hunted. Additionally, improved access along the Dunkle Hills road could increase hunting pressure in this area by both nonsubsistence and subsistence hunters. Increased human use could also lead to more frequent incidents of moose harassment, resulting in stress to individual

animals, but probably not significantly affecting the regional moose population.

The incremental impacts of the proposed action represent a level of habitat loss and disturbance less than that which has or will occur as a result of the other regional actions. Overall, no significant cumulative impacts on moose would be anticipated to result from adding the proposed action to the other regional actions, as there are several hundred thousand acres of moose habitat available on the south side, and measures would be taken under the proposed action to minimize other disturbance-related impacts.

Cumulative Impacts on Wolves

Commercial and private development, mining, and recreational activities on the south side have resulted in the loss of several thousand acres of wolf habitat. Habitat loss can result directly due to the activity itself or indirectly when wolves are displaced from habitat due to human use associated with the activity.

Impacts of the proposed action would add to the impacts of other regional actions discussed above. If the proposed action were implemented, an additional 143 to 217 acres of wolf habitat would be lost. An unknown amount of additional habitat could also be lost by wolves being displaced from areas of use by human development or activities. Facilities developed under the proposed action would result in an increased human presence across a more extensive portion of the south side than under current conditions. With a higher human presence, the frequency of wolf/human interactions would probably increase, increasing the level of disturbance of wolves and possibly causing an increase in mortality. Increased vehicle traffic resulting from the proposed Impacts of the proposed action would add minimally to the impacts of other regional actions discussed above. If the proposed action were implemented, the development of recreational facilities and increased visitor use would not be expected to have an impact on

action could also lead to greater wolf mortality, though in general, wolves are infrequently killed by vehicles in Alaska. However, indirect impacts such as those listed above would not be expected to impact regional wolf populations significantly.

The incremental impacts of the proposed action represent a level of habitat loss and disturbance less than that which has or will occur as a result of the other regional actions. Overall, no significant cumulative impacts on wolf habitat would be anticipated from adding the proposed action to the other regional actions, as there are at least a million acres of wolf habitat available on the south side. However, the cumulative significance of *indirect* impacts on wolves is difficult to determine due to the lack of specific information about wolf populations and areas of use on the south side.

Cumulative Impacts on Trumpeter Swans

Where commercial and private development and recreational activities have taken place in the forested wetlands of the south side, there has probably been a loss of trumpeter swan habitat. Since swans are known to be extremely sensitive to human disturbance, it is likely they have also suffered an indirect loss of habitat as a result of human activity associated with these developments. For example, a study of the relationships between swan distribution and cabins in the Susitna Basin found the probability of swans returning to areas where cabins were built declined as the number of cabins increased. However, the same survey found that an overland separation of a half mile was an adequate buffer to prevent human disturbance to nesting or rearing swans. This distance did not provide an adequate buffer on water bodies (ADFG 1978b).

swan habitat due to a commitment to avoid siting facilities in swan nesting, brood rearing, or molting areas. Although the risk of potential disturbance to swans would rise with increased recreational use on the south side, measures would be taken to reduce or eliminate this risk.

The incremental impacts of the proposed action represent a level of habitat loss and disturbance less than that which has or will occur as a result of the other regional actions. Overall, no significant cumulative impacts on trumpeter swans would be anticipated to result from adding the proposed action to the other regional actions, as measures would be taken under the proposed action to avoid siting facilities in sensitive habitats and to minimize or eliminate human interaction with swan populations.

Cumulative Impacts on Fish

Fish habitat on the south side has been and will continue to be impacted directly by commercial and private development, mining, and recreational activities along or near the shorelines of lakes, rivers, and streams. Recreational fishing along certain rivers has also likely led to trampling of riparian vegetation, ultimately degrading fish habitat, though the degree of degradation is unknown. High numbers of anglers have probably created increased fishing pressure on a few south side water bodies, adversely impacting the aesthetic value of fishing for some people.

Impacts of the proposed action would add slightly to the impacts of other regional actions discussed above. If the proposed action were implemented, increased numbers of anglers would probably be attracted to the area due to improved access (primarily along the Petersville Road); higher numbers of anglers could potentially impacting the aesthetic experience of fishing for some people. However, fish
The American peregrine falcon is the only federally endangered species that may occur on the south side. Several federal and state species of concern may be present, as well. Surveys conducted as part of subsequent environmental analysis would determine for certain whether these species inhabit the study area. Consultation with the U.S. Fish and Wildlife Service regarding such species would continue. Measures developed as part of this consultation would ensure that any of these species found to

populations would not be impacted directly by anglers as the Alaska Department of Fish and Game has the authority to enforce actions to prevent overfishing. Fish populations may be impacted indirectly through degradation of habitat resulting from facility siting and increased recreational use of the area, though the precise level of impact on fish habitat from these actions would be determined when site-specific design and location details for the proposed facilities are developed. Measures would be taken under the proposed action to ensure that impacts remain minimal.

The incremental impacts of the proposed action represent a level of habitat degradation and fishing pressure less than that which has or will occur as a result of the other regional actions. Overall, no significant cumulative impacts on fish or fishing would be anticipated to result from adding the proposed action to the other regional actions, as mitigating measures would be taken under the proposed action to minimize impacts.

Cumulative Impacts on Threatened, Endangered, and Sensitive Species

The status of threatened, endangered, and sensitive species on the south side is unknown; therefore, it is not possible to quantify the level of impact that past, present, or reasonably foreseeable future actions have had or would have on these species. However, it may be assumed that these actions have had at least some level of impact on these species.

occur in the study area would not be affected by the proposed action. Therefore, under this proposal, no impacts would be expected on listed species or species of concern.

An unknown amount of habitat for the Tule greater white-fronted goose, considered a species at risk by the International Waterfowl Research Bureau, may be lost due to spin-off development, though not from construction of proposed facilities themselves. Additionally,

increased recreational use associated with the proposed facilities may disturb the geese, possibly causing some to abandon habitat. However, measures taken as part of the proposed action would reduce or eliminate the likelihood of such disturbance.

Cumulative Impacts on Air Quality

Regional air quality data for the south side are not available; therefore, it is not possible to determine the impacts of past, present, or reasonably foreseeable future actions on air quality in the south side, although it is assumed that these activities have had or will have some level of impact on air quality in the area.

Impacts of the proposed action would likely add slightly to the impacts of other regional actions. Short-term impacts on air quality, such as dust and vehicle emissions from construction-related activities, would be intermittent and temporary, and occur during construction of each of the project phases, as well as while improved sections of the Petersville Road remain unpaved. While long-term impacts on air quality cannot be quantified at this time, it is likely that the proposed action would adversely impact air quality in the Petersville Road area to a greater extent than that which would occur if the proposed actions were not implemented. Air quality impacts from proposed developments and associated human use would likely be minor throughout the rest of the south side compared to the effects of other existing or future south side actions.

Impacts of the proposed action would add slightly to the regional impacts discussed above. Construction and siting of visitor facilities and associated road improvements, as well as recreational use, could impact water quality by causing increases in sedimentation and turbidity, alteration of waterflow and hydro patterns, and contamination of the water with pollutants and additional nutrients. Most water quality impacts would be temporary, lasting only during construction and these

The incremental impacts of the proposed action likely represent a level of air quality degradation less than that which has or will occur as a result of the other regional actions. Overall, however, the cumulative significance of impacts on air quality is difficult to determine due to the lack of baseline air quality data for this area.

Cumulative Impacts on Water Resources

Water resources on the south side have been and will continue to be impacted directly by commercial and private development, mining, and recreational activities along or near the shorelines of lakes, rivers, and streams. Mining in and along the tributaries of Peters Creek has presumably had some effect on water quality in these creeks, although no sampling has been conducted to check this assumption. In addition to the Peters Creek watershed, several others may have been affected by mining including Long Creek, Bear Creek, Costello Creek, Camp Creek, and Colorado Creek. With the exception of some limited activity in the Long Creek watershed, these watersheds have had no mining activity in the past five years and perhaps as long as 10 years. Recent chemical analyses on Cripple Creek, Snowslide Creek, Costello Creek, Camp Creek, Long Creek, and Colorado Creek showed no measurable effect of mining on water quality and indicated that the creeks are in the pristine range (NPS 1995g). It cannot be concluded, however, that any mining activity that takes place in these watersheds does not affect water quality, as sampling was not done during periods of mining operations.

would be minimized through adherence to best construction practices. Likewise, measures would be taken to minimize any longer-term impacts on water quality.

The incremental impacts of the proposed action represent a level of water quality degradation less than that which has or will occur as a result of the other regional actions. Overall, no significant cumulative impacts on water resources would be anticipated to result from

adding the proposed action to the other regional actions, as mitigating measures would be taken under the proposed action to minimize impacts.

Cumulative Impacts on Archeological and Historic Resources

It can be assumed that cultural resources have been or will be impacted by past, present, or reasonably foreseeable future actions on the south side, although without further knowledge of these resources, the degree of impact cannot be determined.

Impacts of the proposed action would not be anticipated to add to the impacts of other regional actions. If the proposed action were implemented, no known cultural sites would be affected, and if cultural resources were encountered during more detailed site planning or construction, facility relocation or mitigation would provide acceptable protection. Overall, no significant cumulative impacts on cultural resources would be anticipated from adding the proposed action to the other regional actions, as no impacts on known cultural resources would occur under the proposed action.

Cumulative Impacts on Subsistence

Resident population growth and visitor use are expected to continue to increase in the south side study area regardless of the outcome of this development concept plan. Much of the growth would be related to tourism, including new hotels (such as the Princess Tours hotel near mile 133 on the George Parks Highway), bed

The Alaska Boards of Game and Fisheries have several mechanisms at their disposal with which to address increases in competition for fish and wildlife resources. These include adjusting seasons and bag limits, regulating modes of access, and implementing closures. Alaska residents would be given the first priority if particular resources in an area were insufficient to support both resident and nonresident harvesting (tier I). If additional restrictions were

and breakfasts, restaurants, service stations, and private full service campgrounds. Along with these new businesses would come more local employment and demands for more housing, especially in the summer.

Along the George Parks Highway, the development trend has been established and the additional visitor facilities identified in the proposed action would result in a relatively small increment of additional impact on subsistence uses.

Along the Petersville Road and at the Tokositna development site, however, the rate and nature of change would be more important since access to the end of the Petersville Road is currently limited. Without visitor facilities at Tokositna, substantial upgrade of the Petersville Road past mile 19 in the foreseeable future is unlikely. Therefore, the displacement of existing nonsubsistence hunting and fishing use to adjacent subsistence areas (particularly game management unit 16(B)) would be an incremental impact associated with the proposed action only.

General population growth resulting from private development and expansion of visitor services in the park area could increase competition for fish and wildlife resources. Improved access may attract more nonlocal residents to the area for hunting and fishing, and displace local residents from places they have customarily used. An increase in the number of visitors to the area during the fall hunting season could result in requests being made to close areas in the immediate vicinity of visitor facilities to firearm use or hunting. required, the boards could implement tier II hunts, whereby eligibility would be further limited to those persons receiving the highest scores on their hunting applications. Establish of a few discreet watchable wildlife areas along the Petersville Road or George Parks Highway could also lead to small hunting closures by the Board of Game following public involvement.

Overall, impacts of the proposed action, when added to other reasonably foreseeable regional

actions, would not have a significant adverse impact on subsistence users or subsistence resources, nor would they result in a lasting redistribution of or reduction in wildlife populations.

Cumulative Impacts on the Matanuska-Susitna Borough

Commercial and private development, land disposal programs, transportation modes, subsistence activities, mining, forestry, and recreational activities have impacted or will impact the Matanuska-Susitna Borough.

Development of a new 162-room hotel at mile 133 on the George Parks Highway by Princess Tours is perhaps the single-most important improvement to visitor facilities and services within the south side area. The hotel is expected to contribute substantially to the economic vitality of the Matanuska-Susitna Borough and nearby communities. Recreational mining in the Peters Hills is another activity that could expand tourism and local visitation on the south side, creating economic benefits for the borough. Moreover, numerous mining claims already filed on state selections along the Petersville Road will become valid upon land conveyance from the federal government. State land management plans and policies will support the maintenance of mining activities and will provide direction on measures to avoid conflicts with other land uses. Development of visitor facilities and related improvements under the proposed action, along with other tourism-related developments and natural resource-based activities would stimulate economic activity in the Matanuska-Susitna Borough.

However, even with the borough's corridor management plans, development of visitor facilities over the long term would likely follow Overall, beneficial cumulative socioeconomic impacts on the Matanuska-Susitna Borough would be anticipated to result from adding the proposed action to the other regional actions, as the borough would receive economic gains,

a less orderly process and could impose adverse impacts on the human environment. Borough land disposals along the Petersville Road would probably continue. Land use impacts, in particular, could be greater without the continued effort by local and state agencies to protect the natural features along road corridors in the area. Likewise, impacts on community services, particularly transient services (tourist information and assistance, restroom facilities, etc.), and rural quality of life would likely be greater as a consequence of less orderly development and inadequate community infrastructure.

Under the proposed action, the state of Alaska would retain all state land adjacent to the Petersville Road. Land disposal by the Matanuska-Susitna Borough along the Petersville Road between the George Parks Highway junction and mile 19 (Forks Roadhouse) would be more restrictive in the long term in order to maintain scenic qualities and avoid strip development. Thus, the proposed action would likely result in more development overall; yet, the accompanying attention to controlled growth and mitigation would likely result in fewer overall adverse impacts on existing communities than would occur without the proposed action. Nonetheless, implementation of the project would be viewed by some local residents as an intrusion on their quiet, remote lifestyle and another example of encroaching urbanization in the area. (Even implementing a no-action alternative would not, however, eliminate this problem, as growth is already occurring in the area.) The incremental impacts of the proposed action, when added to the impacts of other regional actions, would be significant in terms of contributing to economic growth, as well as promoting the orderly development of recreation/tourism resources in the area.

more land use planning, and more orderly development.

Cumulative Impacts on Trapper Creek and Petersville Area

Past, present, and reasonably foreseeable future actions on the south side have impacted Trapper Creek and Petersville in the same manner as they have impacted the Matanuska-Susitna Borough. If a new rail station is established near the George Parks Highway in the south side area, there would be more visitors seeking goods and services at Trapper Creek.

Recreational mining activities could expand tourism and local visitation to the area and create economic benefits for Petersville and Trapper Creek. Additional socioeconomic benefits would accrue to Trapper Creek and Petersville if recreational and community facilities were provided by the Trapper Creek Community Services Association as a result of a land conveyance from the Matanuska-Susitna Borough. As development and visitation on the south side increases, so, too, would traffic levels along the George Parks Highway and other roads in the area. Increased traffic may create a greater demand for fuel, accommodations, and food services along the major travel routes and in communities such as Trapper Creek.

The incremental impact of the proposed action on community services and quality of life in Trapper Creek and Petersville would be significant, and possibly, more adverse, than in the case in which other actions take place without the proposed project. Even without the proposed action, it is likely that ongoing developments would occur in the immediate area, generating the need for additional municipal facilities and visitor services. These developments, however, would result in impacts fewer and smaller in magnitude for the immediate area as would occur under the proposed action. In particular, impacts on community services would be more severe under the proposed action.

Assuming that implementation of the proposed action as well as other unrelated developments Overall, both beneficial and adverse cumulative socioeconomic impacts on Trapper Creek and Petersville would be anticipated to result from adding the proposed action to the other regional actions. The impacts would be beneficial in

are carried out through a controlled process, impacts on land use would be less than the case without the proposed action. Nonetheless, development of facilities at Tokositna and improving the Petersville Road has the potential to increase strip-oriented development on private land between the George Parks Highway and Forks Roadhouse. Similarly, development of facilities at the Tokositna site would impact community services in the Petersville and Trapper Creek areas, due to the need to provide improved ambulance and fire protection services. Other than mining activities, no private developments would occur along the Petersville Road past the Forks Roadhouse, since this area is entirely state owned and managed for retention in state ownership according to the *Susitna Area Plan*. The *Susitna Area Plan* would likely be modified to prohibit additional land disposals along the Petersville Road between the George Parks Highway and mile 19 (Forks Roadhouse).

Impacts on quality of life would similarly be greater with the proposed action both in terms of improving living standards through increased employment and earnings opportunities, as well as potentially diminishing the quiet, rural community atmosphere of the area.

Development pressures would adversely affect many residents of Trapper Creek and Petersville communities who originally moved there for reasons other than conventional employment opportunities. Some residents, such as, miners, trappers, guides, and others who have chosen to live in the area because of its remoteness and natural qualities, are more interested in maintaining a safe, rural, relatively self-sufficient lifestyle afforded by remote living areas. Accordingly, privacy, seclusion, and opportunities for maintaining a rural lifestyle would be reduced under conditions of the proposed action.

terms of generating economic activity and promoting more orderly land use development, but adverse because of the loss of the rural, quiet, self-reliant way of life pursued by many people in this area.

Cumulative Impacts on Talkeetna

Past, present, and reasonably foreseeable future actions on the south side have impacted Talkeetna in the same manner as they have impacted the Matanuska-Susitna Borough. If a new rail station is established near the George Parks Highway in the south side, there may be fewer visitors seeking goods and services in Talkeetna. As development and visitation on the south side increases, so too will traffic levels along the George Parks Highway and other roads in the area. Increased traffic may create a greater demand for fuel, accommodations, and food services along the major travel routes and in communities such as Talkeetna.

The incremental impacts of the proposed action, when added to the impacts of other regional actions would be relatively small, but mainly positive in terms of changes in population, economic activity, community services, and quality of life in Talkeetna. Population changes would be modest, mostly stemming from increased employment of seasonal construction and state and federal operations' workers, as well as workers hired by local businesses. During construction, housing shortages would require the provision of group housing or camp-like facilities, such as cabins or an RV campground. Economic activity would be expanded from increased construction and increased expenditures by tourists. Incremental Commercial and private development, land disposal programs, transportation modes, subsistence activities, mining, forestry, and recreational activities have impacted or will impact the Denali Borough. For example, if the Ahtna campground were constructed in Cantwell, it would result in employment and earnings benefits accruing to the Denali Borough. These impacts would likely be small, but important to the local economy. Tourist developments would also likely result in construction of other traditional commercial developments that serve tourist needs (e.g., gas stations, general stores, restaurants), as well as support an increase in home-building to house

impacts on land use would be insignificant. Community service demands would expand slightly, particularly for restrooms, laundry, and other transient needs of visitors. Quality of life would be improved slightly for those interested in increased employment and earnings. Nonetheless, implementation of the project would be viewed by some local residents as an intrusion on their quiet, remote lifestyle and another example of encroaching urbanization in the area. (Even implementing a no-action alternative, however, would not eliminate this latter problem, as growth is already occurring in the area.)

Overall, modest beneficial cumulative socioeconomic impacts on Talkeetna would be anticipated to result from adding the proposed action to the other regional actions, as Talkeetna would derive economic benefits from increased visitation under the proposed action, but the remote lifestyle or community values would not be diminished significantly.

Talkeetna has been and will continue to be impacted socioeconomically by past, present, and future activities on the south side. Overall, modest beneficial cumulative socioeconomic impacts on Talkeetna would be anticipated to result from adding the proposed action to the other regional actions.

Cumulative Impacts on the Denali Borough

people who move to the area to take advantage of the new employment opportunities. Annexation by the Denali Borough of some of the Ahtna, Inc. lands currently in the Matanuska-Susitna Borough would economically benefit the Denali Borough. The Healy power plant construction project is providing a major boost to the borough economy. The power plant is expected to also employ about 50 permanent workers who would have continuing impacts on the local economy and social environment. Whether the Clear Air Force Base remains operational or not would have significant economic impacts on the borough.

The incremental impacts of the proposed action when added to impacts of other past, present, and future activities on the south side would be small in terms of contributing to economic growth in the borough. Impacts on population, housing, land use, community services, and quality of life would be insignificant under the proposed action.

Overall, minor beneficial cumulative socioeconomic impacts on the Denali Borough would be anticipated to result from adding the proposed action to the other regional actions.

Cumulative Impacts on Cantwell

Past, present, and reasonably foreseeable future actions on the south side have impacted Cantwell in the same manner as they have impacted the Denali Borough. For example, if the additional private campgrounds were constructed in Cantwell, it would result in employment and earnings benefits accruing to this community. These impacts would likely be small, but important to the local economy. Cantwell, which is strategically located at the junction of the Denali and the George Parks Highway, would likely experience an increase in traffic, regardless of the level of development existing in areas further to the south, particularly as more visitors become aware of the connection the Denali Highway provides between the Denali area and Wrangell-St. Elias National Park and Preserve. Tourist developments would also likely result in construction of other traditional commercial developments that serve tourist needs (e.g., gas stations, general stores, restaurants), as well as support an increase in home-building to house people who move to the area to take advantage of the new employment opportunities. The incremental impacts of the proposed action when added to impacts of other regional activities on the south side would be small and mostly beneficial in terms of contributing to economic growth in the borough. Impacts on population, housing, land use, community services, and quality of life would be insignificant under the proposed action. Overall, when added to other regional actions, the proposed action would result in beneficial cumulative impacts by increasing and

economic growth in Cantwell. Impacts on population, housing, land use, community services, and quality of life would be minor. As development and visitation on the south side increases, so too will traffic levels along the George Parks Highway and other roads in the area. Increased traffic may create a greater demand for fuel, accommodations, and food services along the major travel routes and in communities such as Cantwell.

Overall, minor beneficial cumulative socioeconomic impacts on Cantwell would be anticipated from adding the proposed action to the other regional actions.

Cumulative Impacts on Visitor Use in Denali State Park and Denali National Park and Preserve

Visitor use has been and will continue to be impacted socioeconomically by past, present, and future activities on the south side. Development of the new Princess Tours hotel in Denali State Park at mile 133 would likely result in increased visitation to the south side.

As noted, existing visitor use on the south side is difficult to estimate since there are multiple points of access. However, the proposed action would add significantly to existing use. Over the long term, the presence of visitor facilities would increase recreational opportunities throughout the south side. Annual visitation to this area would increase to a maximum estimated level of 183,000 (the incremental increase projected for the Tokositna visitor center) over current levels. The Tokositna visitor center and associated trails would substantially increase use in the west end of Denali State Park, possibly diminishing the primitive values of both the state and national park in the vicinity. Increases in traffic resulting from the proposed action would be most notable along the Petersville Road.

redistributing visitors, but impacts would be adverse in terms of diminishing what some would consider to be the area's primitive values.

**UNAVOIDABLE ADVERSE IMPACTS,
LONG-TERM MAINTENANCE OF THE
ENVIRONMENT, AND IRRETRIEVABLE
OR IRREVERSIBLE COMMITMENTS OF
RESOURCES**

For some visitors and residents on the south side, changes in the natural environment, such as the addition of trails and campgrounds, upgrade/extension of the Petersville Road, and development of visitor centers, would be considered unavoidable adverse impacts of the proposed action. Other people would consider these changes beneficial.

There are no aspects of the proposed action that would jeopardize the long-term productivity of the environment. Impacts associated with

construction, particularly noise, viewshed impairment, and air and water pollution may displace some visitors and wildlife from the immediate area. Such impacts on visitors would be short term as people would be expected to return to the area once construction was completed. These impacts would be short term for most wildlife and fish species, as well, but may cause some wildlife such as bears, moose, and trumpeter swans to leave the area permanently.

Financial resources committed to the proposed action would be, in a practical sense, irreversible. Irretrievable commitments are those involving specific commitments of particular renewable resources. Over the long term, such commitments are usually reversible. The proposed action would result in disturbance or loss of 143 to 217 acres of vegetation. The irretrievable commitment of this acreage would preclude its use as habitat for some wildlife species. However, these commitments are reversible given an active restoration program in the area. Vegetation and habitat values would return with time, although they may not be the same as those that exist under natural or current conditions.

IMPACTS OF ALTERNATIVE A

Like the proposed action, the impact analysis for this alternative assumes that sufficient land use controls would be implemented and in-place prior to major development. The state, National Park Service, boroughs and other jurisdictions, as appropriate, would also work together to manage recreational activities and other uses of public lands on the south side with the intention of keeping impacts within acceptable levels. For additional information on these land use controls and actions, see the “Elements Common to All Action Alternatives” section.

VEGETATION

Analysis

Construction of a 13,000-square-foot visitor center and associated onsite utilities in the northern, central, or southern development zone of Denali State Park would result in the loss or disturbance of an estimated 5 acres of tall shrub, mixed forest, or deciduous forest. Associated parking and road access would cause removal of an additional 4 acres of this vegetation (2 acres for parking of 60 cars and 40 RVs/buses, plus from 2 acres assuming 2,000 linear feet of new road construction). An additional 1 to 30 acres of vista clearing may be required to open and maintain a view to the west or northwest.

The precise number of acres and types of vegetation disturbed or lost from construction of short nature trails cannot be determined until specific locations are identified. However, assuming 5 miles of trail would be built, about 3 acres of mixed forest, deciduous forest, or tall shrub would be lost or disturbed. Informal social trails or campsites may develop off of the planned trails and cause additional vegetative disturbance and/or loss.

A range of 20 to 54 acres of vegetation would be lost or disturbed by the various developments under this alternative. Considering that the

Expansion or construction of the campground in the central development zone would disturb or remove 7–12 acres of mixed and deciduous vegetation.

Brushing and vista clearing along the George Parks Highway would create an unknown amount of vegetation disturbance or loss.

Little if any vegetation would be disturbed or removed to establish the exhibits along the highway.

No impacts on vegetation would result from implementation of other actions in this alternative.

All facilities would be sited to avoid wetlands, or if that is not practical, to otherwise comply with EO 11990 (“Protection of Wetlands”), as indicated in appendix C.

The facilities built under this alternative could also lead to increased development of other lands on the south side, or spin-off development which would cause the loss of an unknown amount of vegetation. However, the incentive for such development would be less. This is because visitor facilities and services would be fewer and more concentrated than under the proposed action, attracting fewer visitors, and decreasing the potential for spin-off development resulting from actions taken under this alternative. Additionally, land use controls would be implemented to minimize the amount of vegetation lost from this development. Other resources discussed below would be similarly less affected by spin-off development under this alternative, so this is generally not repeated below.

Conclusion

existing vegetation classes cover more than a million acres, and the commitments to avoid, wherever possible, construction on sensitive

areas like wetlands, no significant impacts would be expected on vegetation. An unknown amount of vegetation could be lost due to spin-off development on the south side, but this amount would likely be less than under the proposed action.

GRIZZLY AND BLACK BEARS

Analysis

As in the proposed action, this analysis concentrates on the impacts on grizzly bears. Where their ranges overlap, conclusions are also applicable to black bears. Several mitigating measures, including research and monitoring of the bear populations on the south side would be taken to ensure none of the actions would have major adverse effects on bear populations and habitat (see the “Mitigating Measures Common to all Action Alternatives” section).

The analysis that follows discusses both direct and indirect impacts. As under the proposed action, it is assumed that indirect impacts would occur primarily where human activity is most concentrated, as well as in areas where use is more dispersed but still relatively high (i.e., within a radius of a 1–2 miles out from developed areas). Although this alternative would create new developed and dispersed use areas, it is expected that resulting indirect impacts would not significantly affect regional bear populations on the south side because developed and dispersed areas would be focused along the George Parks Highway, leaving most of the south side relatively free of human development and use. For this reason, too, indirect impacts that do occur would be fewer than those which would occur under the proposed action because the latter calls for development throughout the south side rather than just along the highway.

Confrontations and Human Injury. As discussed under the proposed action, bear attacks on humans usually occur when people encounter a bear suddenly or are in the vicinity of bears that have become habituated to people's food or garbage (Herrero 1985). Even with

Habitat Loss and Bear Displacement. Under this alternative, about 20–54 acres of general grizzly habitat would be directly lost due to construction of the visitor center, campground, and other smaller facilities; no prime grizzly habitat would be eliminated. The 20–54 acres of lost grizzly habitat would also be considered a loss of general black bear habitat.

Bears may also be displaced from habitat in either the northern, central, or southern development zone (depending on which was ultimately selected as the visitor center site), as a result of actions taken under alternative A. As noted under the proposed action, research has indicated that noise and human activity associated with human developments (from construction through the life of the project) could disturb bears and cause some to abandon habitat in the vicinity of these facilities. There is less research related to backcountry use and lightly used trail corridors or developed areas, although there is some evidence that even small amounts of human use in an area would result in some temporary grizzly bear displacement.

Implementation of alternative A could also lead to a higher level of private development on the south side, attracting more people to the area and resulting in additional unknown amount of habitat loss and bear displacement, albeit less than under the proposed action.

Due to the widespread availability of grizzly and black bear habitat in the study area (there are about a half million acres of each), the direct loss of 20–54 acres of habitat, as well as the indirect loss of habitat through bear displacement, is not expected to substantially impact bear populations on the south side.

relatively low recreation use levels, several conflicts between bears and humans have occurred on the south side in recent years, including a black bear chasing people from their picnic tables in the existing Byers Lake Campground (1990), a grizzly attack near Byers

Creek between the Chulitna River and the George Parks Highway (1992), and a grizzly trying to get garbage out of litter barrels in Byers Lake campground (1993) (ADNR 1995). Construction of the facilities and the associated increase in human use of the area would result in a greater potential for human/bear interactions than currently exists. However, because the incremental increase in visitors to the south side resulting from implementation of alternative A is less than that expected under the proposed action (140,500 annually compared to 164,000 in the year 2012), and because development would not occur in prime bear habitat, the probability of human/bear interactions would be less likely under alternative A.

There are three primary factors that researchers indicate might affect the likelihood of bear/human confrontations: habitat/terrain, season of the year, and the degree of habituation of bears to human food. These factors are discussed in-depth under “Impacts of the Proposed Action.”

Habitat/terrain — The northern, central, and southern development zones of Denali State Park contain grizzly and black bear habitat, and attract bears in part because of the availability of food such as berries and salmon in the late summer and fall. Development of facilities under alternative A would also attract human visitors to these areas because of the greater interpretive and recreational opportunities provided. Where both bears and humans have major attractants, there is the potential for conflict (NPS 1992b). Though the new developments would displace some bears from these zones, other bears would not be so deterred and conflicts between humans and bears could occur.

Bear/human confrontations often occur when human activities take place in habitat with **Bear Mortality and Harassment**. Actions taken under alternative A would increase the potential for human-caused bear mortality on the south side, but to a lesser extent than the proposed action due to the lesser amount of new

heavy brush or short sight distances because of terrain, or when humans and bears compete for the same resources (e.g., fish). The increase in annual visitation to the south side resulting from actions taken under alternative A would be about 140,500 visitors by the year 2012 (see socioeconomic impacts). Assuming that at least 25% of these visitors participate in hiking or backpacking activities, the chance of human/bear encounters would increase above the current potential. To reduce the chance of conflict, several mitigating measures would be taken including maximizing sight distances along trails, clearing brushy vegetation along trail edges, and avoiding areas of high bear use (see the “Mitigating Measures Common to All Action Alternatives” section for more details). These measures would decrease the chance of surprise encounters between bears and humans, but would not eliminate it entirely.

Season of use — Bears may congregate in the development zones near moose calving areas in the spring and in the late summer and fall when berries ripen and fish swim upstream to spawn. As under the proposed action, these periods would overlap with peak recreational use of the area by tourists, anglers, and hunters. The high concentration of bears and humans during these times would increase the chances of encounters and conflict, possibly necessitating area or trail closures to reduce the risk.

Habituation to human food — Appropriate bear management practices (e.g., provision of bear-resistant garbage cans and food storage sheds, visitor education) would have to be instituted at the new developments included under this alternative from the beginning to try to ensure that no bears become accustomed to finding food at the new developments. However, even with such management practices in place, some conflicts with food conditioned bears would be likely.

access and development. The potential for mortality as a result of management actions (i.e., removals and relocations), defense of life and property situations, bear harassment and automobile collisions would increase from the

current situation, because of greater development in the area, primarily along the George Parks Highway in and near Denali State Park, and associated increased human activity and vehicular traffic. Mortality from hunting and poaching would not be expected to increase under this alternative, as developments would only minimally facilitate access and use of the south side by people interested in these activities. For example, unlike under the proposed action, the Tokositna area would remain inaccessible to road vehicles under alternative A because there would be no upgrade or extension of the Petersville Road into this area.

Conclusion

From 20 to 54 acres of general grizzly bear habitat would be lost or disturbed; no prime grizzly habitat would be lost. The 20 to 54 acres would also be considered a loss of general black bear habitat. This loss would not be expected to substantially impact bear populations. The potential for bear/human confrontations and bear mortality would also increase, but to a lesser degree than under the proposed action because developments would not be in prime bear habitat, nor would the level of development and access or the associated human use of the area be as extensive.

CARIBOU

Analysis

Caribou generally do not use the area inside Denali State Park; therefore, construction of a visitor center, campground, and associated facilities inside the park would not have any adverse impacts on caribou.

Conclusion

No adverse impacts on caribou populations would be expected to occur under this

alternative, as no facilities would be developed in caribou habitat.

MOOSE

Analysis

Several mitigating measures, including research and monitoring of the moose populations on the south side would be taken to ensure none of the actions would have major adverse effects on moose populations and habitat (see section on mitigating measures in the “Alternatives, Including the Proposed Action” chapter).

As stated under the proposed action, impacts on moose could result from the direct loss of habitat from facility siting, as well as habitat abandonment resulting from increased human use of the area. From 20 to 54 acres of general moose habitat would be lost or disturbed as a result of building trails, building a campground in the central development zone, and constructing a 13,000-square-foot visitor center along the George Parks Highway in the northern, central, or southern development zone of the state park. From 10 to 39 acres of moose wintering habitat could be lost if the visitor center (and associated vista clearing) were sited in the Chulitna River corridor in either the central or southern development zone, or if the facility was built in the northern development zone.

Given that there are several hundred thousand acres of general and winter moose habitat on the south side, the loss of this habitat would not be expected to have a major impact on moose populations.

Increased development and human use on the south side would also cause some moose to abandon general and winter habitat if they were unable to tolerate or habituate to disturbance associated with these activities. However, the extent of displacement under this alternative would be lower than under the proposed action because the level of development and access on the south side would be less, with facilities

concentrated along the George Parks Highway in the state park, rather than throughout the Snowmachine and other trails where the snow is packed down often facilitate travel by moose (ADFG 1996c) and could have a beneficial impact on moose. Heavy snow conditions would cause moose to increase use of these trails and could result in increased conflicts between moose and recreation users such as snowmachiners, skiers, or dog mushers.

Moose mortality from hunting would not be expected to increase due to actions taken under this alternative, as developments would only minimally facilitate access and use of the south side by hunters. Increased visitation to the area, and the resultant increased potential moose/human encounters, could also lead to a higher probability of moose harassment, adversely impacting individual moose, but probably not having any effect on moose populations.

The above indirect impacts would not likely affect the regional moose population for reasons similar to those presented at the beginning of the impacts section on grizzly and black bears.

Facilities would be sited to avoid major wildlife travel corridors; therefore, no impacts on moose movement would be expected as a result of alternative A.

Conclusion

From 20 to 54 acres of general moose habitat and from 10 to 39 acres of winter range would be lost or disturbed. This loss of general and critical moose habitat associated with development and related increased human use would not be expected to impact moose populations because moose habitat is abundant throughout the south side. Increased development and human activity would cause some displacement of moose and increase the potential for incidents of moose harassment; however, the degree of impact would be less than in the proposed action because

south side.

development and access would be less extensive under alternative A.

WOLVES

Analysis

Wolves would be affected by the actions taken under alternative A as a result of habitat loss due to facility siting and increased recreational use of the south side. Generally, however, because of the location of the developments under this alternative, there would be fewer impacts on wolf populations in the area than under the proposed action. An estimated 20–54 acres of potential wolf habitat would be lost by facility construction. The loss of this amount of acreage, out of millions of acres of potential wolf habitat on the south side, would probably have little direct impact on wolves. Even the loss of denning habitat would not adversely affect wolf populations as there are sufficient other sites for dens throughout the planning area.

Indirect habitat loss to wolves occurring as a result of this alternative would be similar to, though less extensive than under the proposed action. Increased noise, vehicle use, and human presence associated with the facilities would probably displace wolves, at least seasonally, from the immediate site of development. Wolves could also abandon denning sites if they are disturbed during the early establishment of those sites, and human disturbance during periods when pups are present could reduce feeding opportunities by adults and potentially influence pup survival.

Wolves commonly travel long distances and cover large areas of territory in their search for food (Ballard et al. 1987; Petersen et al.). With an increase in human presence, the frequency of wolf/human interactions would probably increase. These encounters could increase the level of disturbance for wolves and may cause an increase in mortality. However, because access into the south side would be less under

this alternative than under the proposed action, the probability of wolf/human encounters would be lower. It is unlikely regional wolf populations would be greatly impacted under this alternative. Unlike the proposed action, development under alternative A would take place in areas already developed or affected by high human use (i.e., areas primarily located along the George Parks Highway). Thus, constructing additional facilities in these areas would not likely create new impacts on wolves.

Conclusion

From 20 to 54 acres of wolf habitat would be lost or disturbed. Habitat loss from facility siting would have little direct impact on wolf populations in the area. Indirect loss of habitat resulting from facilities and associated human use could force wolves to abandon certain areas, but to a lesser degree than under the proposed action. It is unlikely that regional wolf populations would be greatly impacted.

TRUMPETER SWANS

Analysis

The visitor center and related facilities (such as the campground in the central development zone) would not affect trumpeter swans directly because these facilities would not be sited in swan nesting, brood-rearing, or molting areas.

Increased recreational use associated with these facilities may bring visitors in contact with trumpeter swan habitat during the breeding period when swans are most sensitive to disturbance (see “Impacts of Proposed Action” section for details). Mitigating measures taken as part of this alternative would reduce or avoid swan disturbance. Activities that could damage nesting habitat or cause visual or noise disturbance could be restricted or prohibited from April 1 through August 31 within ¼ mile of swan habitat. Fish populations may also be impacted indirectly by construction of the facilities, the facilities themselves, and associated increased

also be lower.

of active swan nests, staging ponds, marshes, or lakes (see “Mitigating Measures Common to All Action Alternatives” section). This measure would minimize adverse effects on swan populations and habitats.

No other developments would take place in or adjacent to swan habitat; associated trails would be directed away from nesting and/or brooding sites to avoid disturbance. As a result, impacts on swans would be avoided.

Conclusion

The development of recreation facilities and increased visitor use along the George Parks Highway, primarily within Denali State Park, would not be expected to have a significant impact on trumpeter swans due to habitat avoidance and measures taken to minimize human interaction with swan populations.

FISH

Analysis

As under the proposed action, development and access would attract greater numbers of anglers to the area, increasing fishing pressure on local streams, rivers, and lakes, and possibly adversely the aesthetic value of fishing for some people. Fishing pressure would not be expected to increase as much under this alternative as under the proposed action, however, because development and access, being focused mainly in Denali State Park along the George Parks Highway, would be less extensive. The Alaska Department of Fish and Game has the authority to enforce regulations to prevent overfishing where necessary; therefore, increased numbers of anglers would not be expected to impact fish populations directly.

human use. Construction related to strip development would also impact fish. All of these activities could reduce upland and

streamside vegetation, ultimately resulting in degraded fish habitat (see the “Impacts of Proposed Action” section for details). The precise level of impact on fish habitat from construction activities, facilities, and human use would be determined when site-specific facility design and location details are developed. However, impacts under alternative A would be less than under the proposed action because development and human use would be less widespread, impacting fewer streams and other water bodies. Measures such as implementing best management practices during construction would be taken to ensure that impacts that remain minimal.

Conclusion

This alternative would likely lead to increased local fishing pressure (though not as much as under the proposed action); increased fishing pressure on local streams, rivers, and lakes could possibly adversely affect the aesthetic experience of fishing for some people. Fish populations would not be directly impacted by increased visitation due to adjustments in seasons and catch limits as necessary by the state. Fish populations may, however, be impacted indirectly through degradation of habitat associated with facility siting and increased recreational use of the area. Again, the impact would be less than under the proposed action. The precise level of impact on fish habitat would be determined when site-specific facility design and location details are developed. However, measures would be taken to ensure that impacts remain minimal.

THREATENED, ENDANGERED, OR SENSITIVE SPECIES

Analysis

As noted under the analysis of the proposed action, it is unknown whether any threatened, endangered, or sensitive species occur on the south side. The American peregrine falcon is the only federally endangered species that may occur on

the south side. The American peregrine falcon is the only federally endangered species that may occur, while several federal and state species of concern may be present, as well. Surveys would be completed for each site during subsequent environmental analysis to identify the existence of or critical habitats for these species near proposed development sites and to analyze potential impacts. Consultation with the U.S. Fish and Wildlife Service regarding such species would continue. Measures developed as part of this consultation would ensure that any of these species found to occur in the study area would not be affected by actions taken under alternative A. Therefore, under alternative A, no impacts would be expected on the above listed species or species of concern.

The development of a visitor center and related facilities in Denali State Park would not affect the Tule greater white-fronted goose (considered a species at risk by the International Wildfowl Bureau), because facilities would not be sited in nesting, brood-rearing, or molting areas. An unknown amount of habitat could be lost due to development of other land in the area (spin-off development) in response to actions taken under this alternative; however, the extent of such development would be limited by land use controls and would be less than under the proposed action.

As under the proposed action, increased recreational use associated with these facilities may increase the possibility of geese being disturbed by people during sensitive periods which could, in turn, cause geese to temporarily or permanently leave their nests or to abandon breeding areas altogether. Although the risk of potential disturbance to geese would rise with increased recreational use of critical habitat areas, measures included as part of alternative A would reduce or avoid such disturbance.

Conclusion

the south side; several federal and state species of concern may be present, as well. Surveys

conducted as part of subsequent environmental analysis would determine for certain whether these species inhabit the study area. Consultation with the U.S. Fish and Wildlife Service regarding such species would continue. Measures developed as part of this consultation would ensure that any of these species found to occur in the study area would not be affected by actions taken under alternative A. Therefore, under this alternative, no impacts would be expected on listed species or species of concern.

An unknown amount of habitat for the Tule greater white-fronted goose, considered a species at risk by the International Waterfowl Research Bureau, may be lost due to spin-off development resulting from actions taken under alternative A, although not from the actual facilities constructed under this alternative. However, the amount of spin-off development, and, hence the loss of goose habitat, would not be as high under alternative A as under the proposed action. Increased recreational use associated with the proposed facilities may disturb the geese, possibly causing some to abandon habitat, but measures taken as part of alternative A would reduce or eliminate the likelihood of such disturbance.

AIR QUALITY

Analysis

Siting of visitor facilities and associated increases in recreational use could potentially impact air quality on the south side by increasing levels of pollutants in the air, particularly during construction stages. As described in the proposed action, pollutants could include dust, volatile hydrocarbons and other organic compounds, nitrogen oxides, photochemical oxidants, carbon monoxide, and other types of particulate matter. Increases in these forms of pollution would be intermittent and temporary, lasting only during construction; therefore, no long-lasting effects would be anticipated.

Once the facilities were constructed, commercial and recreational vehicular traffic on the George Parks Highway, as well as on other local roads, would increase, corresponding to the estimated 140,500 new visitors (year 2012) traveling to the south side each year as a result of implementing alternative A. Gasoline-powered vehicles emit many of the same pollutants as diesel-powered engines, including nitrogen oxides, photochemical oxidants, and carbon monoxide. The new facilities would also likely attract greater use of the area by snowmachines and other ORVs; however, snowmobile numbers would not be as high as under the proposed action because neither an extension of the Petersville Road nor visitor facilities in Tokositna would be available to facilitate snowmachine use and access under alternative A.

Compared to the proposed action, impacts on air quality of alternative A would be less, primarily because this alternative would have less development. As noted in the proposed action, baseline air quality data for the south side are not available, nor is the level and mix of increased traffic resulting from this alternative known. Therefore, it is not possible at this time to quantify the long-term impacts on air quality of alternative A. However, air quality impacts under this alternative would probably be a fraction of the air quality impacts resulting from other existing or future south side actions (see “Impacts of the Proposed Action” section for further explanation).

Conclusion

Dust and vehicle emissions from construction-related projects would be intermittent and temporary, lasting only during construction. Compared to the proposed action, impacts on air quality of alternative A would be less, primarily because this alternative would have less development (e.g., no Petersville Road construction) and less vehicle emissions associated with incremental increases in visitation. While long-term impacts on air quality cannot be quantified at this time, it is

likely that air quality impacts would be a small fraction of the air quality impacts resulting from other existing or future south side actions.

WATER QUALITY

Analysis

Construction and siting of visitor facilities under alternative A, as well as increased visitor use of the south side resulting from these facilities, could impact water quality by increasing sedimentation and turbidity, altering water flow and hydro patterns, and contaminating the water with pollutants and additional nutrients. The types of impacts would be the same as described for the proposed action, although the area over which these impacts could occur would be smaller than under the proposed action because facilities and use would be concentrated along the George Parks Highway in Denali State Park rather than throughout the south side. Most water quality impacts would be temporary, lasting only during the construction stages of the developments. Measures would be taken to minimize effects on water quality from construction activities and help prevent long-term impacts on water quality and water-dependent resources.

Conclusion

Alternative A would result in a temporary reduction of water quality, particularly during construction stages, but measures would be taken to minimize effects on water quality and water-dependent resources in both the short-term and long-term. Overall, impacts would affect a smaller area than under the proposed action and would be concentrated along the George Parks Highway in Denali State Park.

ARCHEOLOGICAL RESOURCES

Analysis

None of the known historic resources (Windy Creek cabin, Curry Lookout, and the Talkeetna

Since site specific information is not available, the following analysis is based on nearby general survey work (see the “Affected Environment” chapter for further information on archeological resources).

None of the lands on which development would take place has been surveyed for archeological resources. The roadside exhibits along the George Parks Highway would be within the previously disturbed road edge and would not constitute a threat to unknown archeological resources. Trails would be relatively confined developments, and their proposed locations could be adjusted if archeological sites were found before or during trail design.

As noted in the “Mitigating Measures Common to All Action Alternatives” section, a survey for archeological resources would be undertaken before precise locations were selected for all developments. Every effort would be made to avoid significant resources during project design. If avoidance was not feasible, mitigating measures would be taken according to 36 CFR 800 in consultation with the Alaska state historic preservation officer, the Advisory Council on Preservation, and Native American groups as appropriate.

Conclusion

There would be no effect on known archeological sites under alternative A. If archeological resources were encountered during more detailed site planning or construction, facility relocation or mitigation would provide acceptable protection.

HISTORIC RESOURCES

Analysis

Historic District) would be adversely impacted by the actions taken under this alternative, as no

facilities are proposed for these areas and no related increases in recreational use of these sites is expected. However, after consultation with the Alaska state historic preservation office and a search of Alaska Heritage Resource Survey sites in the area, it is evident that placer mining may have occurred near the areas of proposed action. Site survey prior to development should consider the placer mining features typically associated with mining cultural landscapes.

Conclusion

No known historic resources would be affected under this alternative.

SUBSISTENCE

Analysis

The primary focus of development and visitor activity under alternative A would be in the northern, central, or southern development zones of Denali State Park. Five road side pullouts and exhibits would be developed along the George Parks Highway. No trails, campgrounds, or facilities would be developed on or near Denali National Park lands. No future visitor facilities or services are proposed for Broad Pass or Talkeetna. Therefore, no significant impacts are anticipated on existing subsistence use activities or populations of fish and wildlife upon which federal subsistence users are dependent.

All rights of access for subsistence harvest on NPS lands are granted by section 811 of ANILCA. The park and preserve are managed according to legislative mandates, NPS management policies, and the *Denali General Management Plan*. No actions under alternative A would affect the access of subsistence users to natural resources in the park and preserve.

As in the proposed action, continued implementation of ANILCA provisions would mitigate any increased competition from

resource users other than subsistence users on Denali National Park lands. Therefore, resource competition on parks lands would not be adversely affected under this alternative.

The focus of alternative A is a visitor center (up to 13,000 sq ft) in the northern, central or southern development zone in the Denali State Park. For the reasons noted under the proposed action, visitor center developments along the George Parks Highway in the state park would have minimal incremental effect on existing subsistence use. In the northern and southern development zones, secondary development of nearby private land would likely result, thus increasing local resident populations and adding pressure on fish and wildlife resources. However, actions that promote visitor use in this area would probably result in these private lands eventually being developed to support tourism and growing local population. The effects on subsistence uses thus will be linked to timing of development, and the degree of impact associated with the type and extent of impact of development activities.

Conclusion

Under alternative A, no significant impacts would be anticipated on existing subsistence use activities or populations of fish and wildlife upon which federal subsistence users are dependent. Access of subsistence users to natural resources in the park and preserve would not be affected.

**MATANUSKA-SUSITNA BOROUGH
ECONOMY AND SOCIAL
ENVIRONMENT**

Analysis

The methods of analysis are similar in the alternatives to that applied for the proposed action case and will not be repeated.

A large visitor center would be developed in one of three development zones (northern, central, or southern) of Denali State Park. Roadside interpretive waysides, a 50-site campground, and additional trails would also be built. The visitor center and roadside trails and exhibits would interact positively with the mountaineering center at Talkeetna and any private hotel development. This alternative would improve visitor access to the south side and would encourage reallocation of some visitors from north side Denali to south side Denali visitor facilities. Increased visitors would include package tour and independent non-Alaska residents and Alaska residents seeking lodging, sightseeing, sports activities, roadside interpretation, and other day use facilities.

The net construction cost for park facilities improvements is estimated at about \$5.5 million (in 1995 dollars) regardless of which site was chosen for the visitor center (northern, central, or southern development zone).

Visitor projections were made to evaluate impacts on the regional economy and for facilities space planning. The analysis of visitor projections are based on one prepared earlier for a large-scale visitor center and hotel complex in Talkeetna, which is provided in “Talkeetna Visitor Center Impact Assessment” (op. cit., April 1992). Visitor projections were based on several data sources, including the Alaska Visitor Statistics Program II undertaken by the Alaska State Division of Tourism, NPS visitor statistics, and several other NPS and local government sources augmented by interviews with persons in the visitor industry including local and regional experts and workers. Projections of both baseline and incremental visitors were developed.

Visitor projections developed for a Talkeetna large visitor center as envisioned in 1992 could

apply to the visitor center identified for alternative A. The basic visitor groups, likely growth rates, and basis for estimation would not significantly change. However, the capture rates suggested for the earlier Talkeetna visitor center analysis might be low, considering that the primary development would be near the George Parks Highway in Denali State Park. This may be considered, but the initial suggestion is to note that alternative A is very similar to the previously proposed Talkeetna visitor center along with development of a major hotel, and this fact leads to the conclusion that the estimates and projections are perhaps as close as the information permits. Thus, the incremental visitor projections used here are the same as the chosen middle scenario for Talkeetna in the study noted above and are presented in table 13. They are as follows: 88,000 in year 2002; 111,000 in year 2007; and 140,500 in year 15 (2012), the final year of the projection horizon. It is worth noting that incremental visitation at the visitor center includes package tour visitors at the new Princess Tours hotel. However, these visitors are considered to be part of the baseline for purposes of estimating impacts on the regional economy. No additional package tour hotels are assumed for the visitor projections under alternative A.

**TABLE 13: BASELINE AND INCREMENTAL VISITATION FOR ALTERNATIVE A
YEARS 2002, 2007, AND 2012**

Visitor Center Users	Year 2002	Year 2007	Year 2012
Baseline Component	88,000	111,000	140,000

Incremental Visitors	88,000	99,500	114,000
Total Visitors	176,000	210,500	254,000

Baseline projections for a visitor center located near the George Parks Highway would be substantially higher than indicated for Talkeetna. This is because of substantially higher traffic flows on that roadway. Nonetheless, as indicated in the discussion of the “Affected Environment,” growth in visitation on the north side of Denali is limited somewhat by restrictions on the number of vehicles allowed past Savage River on the Denali Park Road during the core summer season. Also, new south side facilities (e.g., the new Princess Tours hotel and the proposed visitor center) are expected to absorb some of the growth in visitation to the area. Thus, the rate of growth in baseline visitation to the Denali region would likely be reduced as new facilities in the south side are developed. Assuming that baseline growth would result in double the number of baseline visitors projected for incremental visitors through year 2002 and half that projected for the incremental visitors thereafter, total visitation at the visitor center at the George Parks Highway would amount to about 176,000 in year 2002; 210,500 in year 2007; and 254,000 in year 2012. These visitation projection figures (shown in table 13) are moderately higher than indicated for the Tokositna visitor center under the proposed action. As envisioned, the Tokositna visitor center would be a destination-type facility and would attract substantially greater numbers of new visitors than a visitor center located on or near the George Parks Highway. (This of course assumes that an additional package tour hotel is built under the proposed action.) Total visitation, however, would be somewhat higher under alternative A because of the large number of baseline visitors traveling on the George Parks Highway who would be expected to use the new visitor center and associated facilities.

The estimates of construction and operations outlays and visitor projections are key elements in the analysis of socioeconomic impacts. For

purposes of the analysis, economic effects are divided into two categories: direct and indirect/induced. Direct effects result from NPS and state construction and operations outlays as well as visitor expenditures on goods and services provided by local industries. Indirect/induced effects represent spin-off activities or ripple effects caused by increased direct expenditures within the region. These are estimated using the IMPLAN model.

Direct Effects. Visitor center and other park facility construction: Constructing the visitor centers and other park facilities is estimated to cost about \$7.6 million (in 1995 dollars). Construction would generate about 43 jobs with estimated earnings of \$1.6 million (in 1991 dollars). It is likely that a significant portion of the jobs and earnings would go to locally hired workers.

Incremental visitation has been projected for the large visitor center at 88,000 visitors in the year 2002. (Baseline visitation, i.e., visitation by persons traveling on the George Parks Highway for other reasons, would add many additional visits to these facilities.) Incremental visitor expenditures for the year 2002 have been projected by visitor category, i.e., package tour, independent, inde-package, non-Alaska resident visitors, and resident visitors and non-resident visitors who are visiting friends and relatives. These incremental expenditures were accumulated from detailed estimates of expected visitor expenditures on numerous items categorized under the following major groupings: transportation/guide services; lodging; food and beverage; retail shopping; and auto/RV fuel and other services. Total incremental visitor expenditures (in 1991 dollars) were projected to be about \$4.4 million in 2002. In addition, NPS and state outlays for personnel would amount to about \$0.24 million when the facility is in operation. Together, these expenditures would generate about 115 direct

jobs with earnings of \$1.6 million (in 1991 dollars).

Indirect Effects. For alternative A, indirect and total impacts have been projected for facilities construction at 78 and 121 workers with earnings of about \$1.6 million and \$2.9 million, respectively. Indirect and total impacts associated with park operations and visitor expenditures have been projected for year 2002

Population and Housing. Population effects from the expansion of public facilities on the south side with alternative A might include in-migration of permanent and seasonal workers (Three permanent and eight seasonal workers would be required). Also, a few workers might relocate to areas near construction sites during facility construction. Housing would not be provided for NPS or state staff, except for possibly two apartments in the visitor center. Even though the 1990 census reports that the available housing stock contains a substantial number of vacant cabins, second homes, or other part-time use residences, these may not be available for sale or rent to seasonal workers. Sufficient housing may not be available from the current stock. In the case of the Denali State Park visitor center locations, NPS and state staff and visitor service workers might find it necessary to commute to their jobs from nearby communities.

Economy. Economic benefits from facilities construction and operation and visitor use increases would accrue to local residents in the area in the form of jobs and earnings. The construction phase would employ construction workers and require construction equipment, supplies, and materials. The operations phase would require hotel maintenance, hospitality, food service, and other workers and park facilities and transportation maintenance personnel as well as interpretive, recreation, and entertainment staff. Direct, indirect, induced, and total impacts would accrue to local residents in the form of increased jobs and earnings as reported above.

Land Use. There would be pressures for land use changes near the new visitor center,

(assumed first full-year of park operations) at about 52 workers with \$0.8 million in earnings (in 1991 dollars) and 167 workers with about \$2.5 million in earnings (in 1991 dollars), respectively.

Overview of Socioeconomic Effects

including lodging, restaurant, and retail sales outlets. If the Matanuska-Susitna Borough instituted stronger land use actions that would restrict and direct development in the vicinity of visitor centers and other park facilities in the northern and southern development zone along the George Parks Highway (there is no private land in the central development zone), it would protect the major transportation corridor from inappropriate development, without necessarily impacting existing local businesses.

Municipal Services. Public facilities are not likely to require significant improvements under alternative A. There would be increased requirements for planning as well as increased demand for fire and ambulance services. It is likely that facilities for such services would be established at Trapper Creek. As noted in the discussion on the "Affected Environment," fire services are provided by special service areas with funding normally from local property taxes. Presumably, the borough would take responsibility for some of the impacts arising from the proposed developments under alternative A. The Trapper Creek community could also be required to fund part of new facilities and related operations (presumably those related to existing and future baseline needs). Thus, impacts on municipal services provided by Matanuska-Susitna Borough would likely be significant.

Public revenues from property taxes and the 5% hotel tax would accrue to the Matanuska-Susitna Borough from increased private real property development and increased visitor lodging expenditure, respectively. These revenues would provide the Matanuska-Susitna

Borough with the capability to fund public services, as needed.

Social Environment. Quality of life impacts on residents in the Matanuska-Susitna Borough would be determined by the magnitude of increases in development and visitor use in given areas. Those interested in economic improvement would find encouragement in the However, the new facilities would encourage more visitor use and development which would increase traffic, noise, and similar urban-type impacts. Residents with a desire for remoteness and a quiet community atmosphere would be affected by the changes. Those who have located in the area for this lifestyle reason would feel that encroaching urbanization with attendant issues of crowding, noise, increased tourism, and more intensive land use would be a degradation of the environment from their perspective. These impacts would be less than in the proposed action because facilities are concentrated in the state park along the George Parks Highway, where few people live and there is already substantial traffic and visitor use in the summer.

Conclusion

There would be direct and indirect benefits to the Matanuska-Susitna Borough residents from expanded park facilities in terms of increased employment and income-producing opportunities for local residents. Most of the impacts would be seasonal, i.e., three to four months during the summer peak, not year-round. The latter would mostly accrue to residents within easy commute range or located at the sites of new facilities. There would be increased operation and maintenance costs for the new park facilities. Population in-migration could occur as a result of increased demand for seasonal workers during construction and operations. In addition, there would be some increase in population due to private business expansion in the area. Some housing might be available from the existing housing stock, but more likely there would be a need to develop additional employee housing. Adverse land use

form of more jobs and earnings available locally. This would also reduce the need for commuting to jobs in other areas by local residents. The Matanuska-Susitna Borough would perhaps attract other business and residential use to the area through improved land use planning. Development would be higher quality and better organized.

effects could occur unless certain land use actions are imposed by the Matanuska-Susitna Borough and other transportation corridor protections are instituted by the state of Alaska and the borough. Municipal service impacts would likely be insignificant. Quality of life changes would be positive for those interested in increased availability of local jobs and earnings. For those interested in maintaining a sense of remoteness and a quite rural atmosphere, the perception may be of a degraded quality of life. Residents of south-central Alaska would benefit from improved access for recreational purposes.

TRAPPER CREEK AND PETERSVILLE ECONOMIES AND SOCIAL ENVIRONMENT

Analysis

Construction at the sites in Denali State Park might provide construction employment and income to residents of Trapper Creek community since it is in the vicinity of the work. Both NPS and state operations and visitor service industries might also provide work and earnings for Trapper Creek community residents, since many jobs would be available. There would also be spin-off economic benefits to other segments of the Trapper Creek economy because of housing and subsistence requirements of the workers and other service needs and expanded business opportunities to provide goods and services to visitors. Population impacts would be minimal, involving primarily the in-migration of seasonal workers.

Construction and operations of a visitor center under alternative A would have minor impacts on the Petersville area due to its remoteness.

Both communities have relatively large numbers of vacant housing units due to many vacation cabins and/or second homes being located there. Trapper Creek, which is currently experiencing moderate growth in residential development, is especially well-positioned to receive in-migrating workers and their families associated with development under alternative A.

Land use impacts would be negligible in the immediate area under alternative A. However, Quality of life impacts owing to development would include additional employment opportunities for those seeking jobs and income. The need for commuting to jobs in other areas would be reduced. However, many residents of Trapper Creek and Petersville communities moved there for reasons other than conventional employment opportunities. Some residents are more interested in maintaining a safe, rural, relatively self-sufficient lifestyle afforded by remote living areas. They may view visitor center development and attendant increases in tourism as encroaching urbanization, which they wished to leave behind when they moved to the area.

Conclusion

Trapper Creek could realize economic benefits from constructing and operating a visitor center in the state park. Most of the impacts would be seasonal, i.e., three to four months during the summer peak, not year-round. Building the visitor center in the southern or central development zone in Denali State Park could increase visitation to the community. Population in-migration would increase due to the employment of seasonal construction workers and seasonal and permanent operations workers. Housing impacts would be negligible due to the availability of large numbers of vacant units (primarily vacation cabins and/or second homes) and recent expansion in the residential housing market. Modest adverse land use

uncontrolled development could result unless the Matanuska-Susitna Borough efforts to establish land use actions and road corridor protection requirements are successful.

Trapper Creek Ambulance Service, which is all volunteer, is likely to be impacted as a consequence of increased visitation to the area and additional seasonal employees living in the area. Fire services may also be required as a result of development of facilities and services under alternative A. Other municipal services in the two communities would not be substantially impacted under alternative A.

impacts would be likely within the immediate area, unless land use actions and road corridor protection measures are instituted. Adverse municipal services impacts are likely, particularly in regard to fire and ambulance services. Some Trapper Creek residents might see the increase in visitation and related employment and income as an advantage to their community; while others might see it as a decline due to the negative impacts associated with increased urbanization and possible loss of the rural community atmosphere. Because of its location relative to the proposed visitor facilities as described for alternative A, Petersville would be unaffected by the construction and operation of a visitor center as envisioned under alternative A.

TALKEETNA ECONOMY AND SOCIAL ENVIRONMENT

Analysis

The large visitor center development under alternative A might draw from the Talkeetna labor force for both construction and operations. For purposes of analyzing the impacts of the alternative, direct construction and operations of the visitor center and visitor expenditures were considered as part of the overall impacts estimated, as discussed above in the section on the Matanuska-Susitna Borough.

Overview of Socioeconomic Effects

Population and Housing. It is unlikely that the Talkeetna population would be impacted significantly under alternative A. Employment and earnings opportunities would be available to **Economy.** Jobs and income-growth opportunities from construction and operations of new facilities and from visitor use would benefit Talkeetna residents. Some additional visitor services would likely be required in Talkeetna, particularly to serve package tour visitors transiting to and from the Alaska Railroad station and the new Princess Tours hotel near mile 133 on the George Parks Highway, who would be expected to visit the visitor center envisioned under alternative A. Layovers by such visitors could have significant positive economic effects, if sufficient time was allowed for sightseeing and shopping at local establishments, and flightseeing and other recreational activities. It is possible that the tour providers would include special tour/recreational opportunities for hotel visitors at Talkeetna, including time to visit the visitor center. These kinds of visitor uses and related economic activities would be presumed to occur under the no-action alternative; nonetheless, they would likely be expanded under alternative A.

Land Use. There would be minimal, if any, land use impacts in Talkeetna under alternative A.

Municipal Services. There would be only modest impacts on municipal services in Talkeetna. As noted in the discussion for the proposed action, a critical need is for covered waiting areas, restrooms, and laundry facilities designated for visitors. Any expansion of tourism-related activities would result in impacts on these facilities.

Public revenues from property taxes and the 5% hotel tax would accrue to the Matanuska-Susitna Borough from increased private real property development and increased visitor lodging expenditure, respectively. These revenues would provide Matanuska-Susitna Borough with the financial resources to provide

local residents and a few would obtain employment or expand or establish visitor-oriented businesses due to increased visitation to south side Denali. Housing impacts would also be insignificant.

parks and recreation-oriented facilities and services, as needed.

Social Environment. Quality of life impacts resulting from alternative A would be positive for persons seeking jobs and income. Many of Talkeetna's residents have moved there for reasons other than conventional employment opportunities. Some residents are more interested in maintaining a safe, rural, relatively self-sufficient lifestyle afforded by remote living areas. They might view visitor center development in the south side of Denali National Park and Preserve as encroaching urbanization, which they wished to leave behind when they moved to the area. A July 1991 survey, which included a question on the desirability of the then-proposed large Talkeetna visitor center, drew mixed responses, about evenly pro and con. Another survey in October 1991 obtained about 60% "no" and 40% "yes" votes. This suggests a fairly negative feeling about the development of a large visitor center in Talkeetna. Development of a large visitor center in the state park would not be expected to generate such negative feelings.

Conclusion

Talkeetna residents would receive economic benefits associated construction and operation of new facilities and from visitor use under alternative A. Most of the impacts would be seasonal, i.e., three to four months during the summer peak, not year-round.

Population and housing impacts would be negligible for Talkeetna. Land use impacts would be minimal. Municipal services would be impacted slightly; there is a need for visitor accommodations including a covered waiting area, restrooms, and laundry facilities. Quality of life impacts would be perceived as positive

by residents interested in expanded employment and earnings opportunities. They would be viewed as negative by residents who perceive the Petersville Road and Tokositna visitor center developments as encroaching urbanization which they wished to leave behind when they moved to the area.

DENALI BOROUGH ECONOMY AND SOCIAL ENVIRONMENT

Analysis

Development of the new facilities under alternative A, particularly in the northern and Some small and insignificant long-term employment opportunities would be created as part of developing a large visitor center in Denali State Park, if the facility were located in the northern development zone. Some indirect benefits would be likely for merchants supplying visitors to a Denali State Park visitor center (although most visitors would be a part of baseline visitation to Denali National Park and Preserve). Some borough residents might welcome the increased economic activity associated with increased tourism, while others might not.

Some small, but important long-term employment opportunities would be created as a result of additional use and development on the south side of Denali, such as the small visitor center in Denali State Park. Some indirect benefits would be likely for merchants supplying visitors to the area (although most visitors would be a part of baseline visitation to Denali National Park and Preserve). Most of the impacts would be seasonal, i.e., three to four months during the summer peak, not year-round. Land use and community services impacts would likely be negligible. Similarly, quality of life impacts would likely be minimal.

CANTWELL ECONOMY AND SOCIAL ENVIRONMENT

Analysis

central development zones of Denali State Park, might result in some spill-over of economic benefits to Denali Borough. The fact that the state park is located 40 miles south of Denali Borough suggests that a few of the jobs created at the visitor center and related private visitor facilities might go to residents of Denali Borough, especially residents of Cantwell. These impacts would be small and insignificant to the local economy.

Conclusion

The development of a large visitor center at a location in either the southern or central development zone of Denali State Park would have only a minimal impact on the Cantwell community.

Conclusion

Because of the distance from the identified locations for a new visitor center, it is anticipated that the Cantwell community would receive only minimal direct impacts under alternative A.

Minimal socioeconomic impacts are anticipated on the Cantwell area from the proposed action, mostly because of the relatively long distances between the community and Denali State Park. Population and housing impacts on Cantwell would be minimal. Some small, but relatively important employment opportunities would be created as a result of additional use and development in other areas of the south side, such as the visitor center at Denali State park. Some indirect effects could occur as a result of increased visitor expenditures as visitors pass through the Cantwell area on their way to other destinations. Most of the impacts would be seasonal, i.e., three to four months during the summer peak, not year-round. Land use and community services impacts are likely to be

negligible. Similarly, quality of life impacts are likely to be minimal.

VISITOR USE - DENALI STATE PARK AND DENALI NATIONAL PARK AND PRESERVE

Analysis

Short nature trails would be built near the new visitor center in Denali State Park and at some wayside pullouts on the George Parks Highway nearby. Roadside interpretive exhibits would be installed in four existing waysides on the George Parks Highway. These would provide opportunities for enhancing the Denali National Park and Preserve and Denali State Park visits.

Trail access to Denali National Park and

Conclusion

Opportunities for visitation to the south side would be enhanced and expanded due to development of a large visitor center in Denali State Park. Roadside interpretive wayside, short trails, and day use facilities would also add to the south side Denali National Park experience. The Princess Tours hotel at mile 133 on the George Parks Highway will provide lodging and food facilities for package tour and independent tour visitors from out-of-state that could be encouraged to stay in the area longer to visit new park facilities. Of course, visitation growth would also derive from normal population growth within Alaska and statewide increases in tourism.

Opportunities for visitation to the south side would be enhanced and expanded due to development of a visitor center at Tokositna campgrounds, public use cabins, nature trails, hiking trails, and roadside attractions and other day use facilities would also add to the south side Denali National Park experience. A large number of visitors, particularly first-time visitors and those traveling in organized tours or as family groups, would be provided increased recreational and interpretive opportunities. Increased development activity might occur on private lands, although instituting stricter land

Preserve would not be achieved in this alternative. The Princess Tours hotel being developed at mile 133 on the George Parks Highway will provide overnight accommodations for package tour and independent tour non-Alaska resident visitation that may be encouraged to stay in the area longer to visit new park facilities. Greater numbers of regional Alaska residents would be attracted so as to pursue sports and recreation in south side Denali areas. Most of these would arrive in autos, light trucks, and RVs. Visitation to south side Denali would increase by about 140,000 annually (the incremental increase projected for the visitor center under alternative A) over the forecast period.

use controls (assumed for each of the action proposals) would reduce potential adverse impacts on the visual and aesthetic quality of the road corridor. Developing visitor facilities along the George Parks Highway would likely encourage other visitor uses in the area south of Denali National Park and Preserve, such as cross-country skiing and snowmachining. Residents from south-central Alaska would benefit from improved facilities in the area.

IMPACTS IF NO LAND USE CONTROLS ARE IMPLEMENTED

As noted, the preceding analysis was based on the assumption that land use controls and other actions to manage uses on the south side would be adopted and implemented prior to initiating the major development associated with this alternative (see “Elements Common to All Action Alternatives” section). If land use controls were not implemented, the potential for spin-off development would be greater than described above. This is because there would likely be fewer restrictions on the type and extent of development allowed on the south side.

A greater potential for spin-off development would result in greater impacts on natural and socioeconomic resources than described in the preceding analysis (see this section for the proposed action for a description of the types of impacts). However, as stated in the analysis, the

magnitude of impacts from this additional spin-off development would not be as high under alternative A as discussed under the proposed action.

This alternative would attract greater numbers of recreationists to the south side, though use would be focused primarily along the George Parks Highway as opposed to throughout the south side as under the proposed action. It is assumed that land managers would work together to manage these uses. If such cooperative efforts were not made, more frequent conflicts could arise between user groups (see discussion under this section for the proposed action). However, because fewer people would be attracted to the south side under this alternative, it is expected that the frequency of conflict would be less than that which would occur under the proposed action in the situation that cooperative management did not occur.

IMPACTS OF ALTERNATIVE B

Like the proposed action, the impact analysis for this alternative assumes that sufficient land use controls would be implemented and in-place prior to the major development. The state, National Park Service, boroughs and other jurisdictions, as appropriate, would also work together to manage recreational activities and other uses of public lands on the south side with the intention of keeping impacts within acceptable levels. For additional information on these land use controls and actions, see the “Elements Common to All Action Alternatives” section.

No spin-off development is expected to result due to this alternative because there would be little incentive for such development. Visitor facilities and services would be minimal compared to the proposed action or alternative A, and would not be expected to lead to a significant increase in visitation; therefore, further development would be unlikely to occur as a result of actions taken under this alternative. If spin-off development were to occur, however, land use controls would be in place to minimize the impacts on resources in the area. This same conclusion applies to other resources below and is not repeated under each heading.

VEGETATION

Analysis

Construction of a 1,500-square-foot visitor center in the northern, central, or southern development zone of Denali State Park would result in the loss or disturbance of an estimated 2.5 acres of tall shrub, mixed forest, or deciduous forest. Associated parking and road access would remove an additional 3 acres of vegetation (1 acre for parking of 25 cars and 15 From 13 to 45 acres of vegetation would be lost or disturbed by the various developments under this alternative. Considering that the existing vegetation classes cover more than a million

RVs/buses, plus 2 acres assuming 2,000 linear feet of new road construction). An additional 1 to 30 acres of vista clearing may be required to open and maintain a view to the west or northwest.

The precise number of acres and types of vegetation disturbed or lost from construction of short hiking/interpretive trails cannot be determined until specific locations are identified. However, assuming 5 miles of trail would be built, about 3 acres of mixed forest, deciduous forest, or tall shrub would be lost or disturbed. Informal social trails or campsites may develop off of the planned trails and cause additional vegetative disturbance and/or loss.

Construction of the campground in the Denali State Park central development zone would disturb or remove 3.5–6 acres of mixed forest, deciduous forest, or tall shrub vegetation.

Little if any vegetation would be disturbed or removed to establish the exhibits along the highway.

An unknown amount of vegetation would be lost or disturbed due to brushing and vista clearing along the George Parks Highway.

No impacts on vegetation would result from implementation of other actions in this alternative.

All facilities would be sited to avoid wetlands, or if that is not practical, to otherwise comply with the Executive Order (“Protection of Wetlands”), as indicated in appendix C.

Conclusion

acres, and the commitments to avoid, wherever possible, construction on sensitive areas like wetlands, no significant impacts on vegetation would be expected. No spin-off development

would be expected to result from actions taken under this alternative; therefore, there would be no related impacts on vegetation.

GRIZZLY AND BLACK BEARS

Analysis

Like the proposed action and alternative A, this analysis concentrates on the effects to grizzly bears. Where their ranges overlap, conclusions are applicable to black bears as well. As under the proposed action and alternative A, impacts of alternative B include the direct and indirect loss of bear habitat, and increased potential for confrontation and human injury.

Several mitigating measures, including research and monitoring of the bear populations on the south side would be taken to ensure none of the actions would have major adverse effects on bear populations and habitat (see "Mitigating Measures Common to All Action Alternatives" section).

The analysis that follows discusses both direct and indirect impacts. As under the proposed action and alternative A, it is assumed that indirect impacts would occur primarily where human activity is most concentrated and in areas where use is more dispersed but still relatively high. Although alternative B would create new developed and dispersed use areas, it is expected that resulting indirect impacts would not significantly affect regional bear populations on the south side because developed and dispersed use areas would be minimal and focused along the George Parks Highway, leaving most of the south side relatively free of human development and use.

In general, it is expected that there would be fewer impacts on bears under alternative B than either the proposed action or alternative A. This is because the level of development, access, and associated human use would not be as extensive under alternative B and, unlike the proposed Overall, because this alternative would not result in significant increases in south side

action, no facilities would be located in prime bear habitat where there are potentially large numbers of bears.

Habitat Loss and Bear Displacement. Under this alternative, about 13–45 acres of general bear habitat would be directly lost due to construction of the visitor center, campground, and other smaller facilities; no prime grizzly habitat would be eliminated. This loss of grizzly bear habitat would also be considered a loss of general black bear habitat.

Bears could also indirectly lose habitat if they were displaced from part or all of either the northern, central, or southern development zone (depending on which was ultimately selected as the visitor center site) due to the new visitor facilities and associated human use. However, under alternative B, development would be small in scale and resulting visitation to the south side would not be expected to increase significantly above existing trends. For these reasons, the impact of alternative B on bear displacement would be minimal.

Due to the widespread availability of grizzly and black bear habitat in the study area (there are at least a half million acres of each), the direct loss of 13–45 acres of habitat, as well as the indirect loss of habitat through bear displacement is not expected to substantially impact bear populations on the south side.

Confrontations and Human Injury. Virtually all black and grizzly bear attacks/confrontations occur when people encounter a bear suddenly or are in the vicinity of bears that have become habituated to people's food or garbage (Herrero 1985). There are three primary factors that researchers indicate might affect the likelihood of bear/human confrontations: habitat/terrain, season of the year, and the degree of habituation of bears to human food. These factors are discussed in-depth in the "Impacts of the Proposed Action" section.

visitation above existing trends, actions taken under alternative B would not substantially

increase the probability of bear confrontations and human injury. Even so, appropriate bear management practices would be instituted at the new developments included under this alternative from the beginning to reduce the chance of bears becoming accustomed to finding food at the new developments.

Bear Mortality and Harassment. Actions taken under alternative B would increase the potential for human-caused bear mortality on the south side, but to a lesser extent than the proposed action or alternative A due to the lesser amount of new access and development. The potential for mortality as a result of management actions, and defense of life and property situations would increase slightly from the current situation, because of greater development in the area, primarily along the George Parks Highway in and near Denali State Park. Mortality from hunting and poaching would not be expected to increase due to actions taken under this alternative, as developments would only minimally facilitate access and use of the south side by people interested in these activities. The number of bears harassed by visitors or killed/injured by automobiles would also not increase under alternative B, because visitation to the area would not increase significantly above existing trends.

Conclusion

From 13 to 45 acres of general grizzly and black bear habitat would be lost or disturbed as a result of facility siting. This loss would not be expected to substantially impact bear populations because habitat is abundant throughout the south side. The potential for bear displacement and bear/human confrontations would be minor because facilities would be small-scale, and associated visitation would not increase significantly over current trends. Bear mortality would increase slightly, but to a lesser degree than either the proposed action or alternative A because of the lower level of access and development, as well as associated increased development and human activity associated with these facilities would also cause

human use. Significant impacts on bear populations or habitat would be very unlikely.

CARIBOU

Analysis

Caribou generally do not use the area inside Denali State Park; therefore, facilities proposed under alternative B would not have any adverse impacts on caribou.

Conclusion

No adverse impacts on caribou populations would be expected under this alternative, as no facilities would be developed in caribou habitat.

MOOSE

Analysis

Several mitigating measures, including research and monitoring of the moose populations on the south side would be taken to ensure none of the actions would have major adverse effects on moose populations and habitat (see "Mitigating Measures Common to All Action Alternatives" section).

Impacts on moose could result from the direct loss of habitat, as well as habitat abandonment, resulting from facility siting and increased human use of the area. From 13 to 45 acres of general moose habitat would be lost or disturbed as a result of implementing alternative B. From 7 to 36 acres of moose wintering habitat could be lost if the visitor center (and associated vista clearing) were sited in the Chulitna River corridor in either the southern or central development zone, or if the facility was built in the northern development zone. This would be a minor loss of general habitat considering that there are several hundred thousand acres of general and winter moose habitat on the south side.

some moose to abandon habitat if they were unable to tolerate or habituate to disturbance

associated with these activities. However, the degree of displacement would be lower than that under the proposed action and alternative A because the level of development would be smaller and, unlike the proposed action, facilities would be concentrated along the George Parks Highway in the state park rather than throughout the south side. The number of encounters between moose and people, and hence the potential for moose harassment, would not increase under alternative B. This is because facilities developed under this alternative would not be expected to result in significant increases in visitation over existing trends. Moose mortality from hunting would not increase either, as developments would only minimally facilitate access and use of the south side by hunters.

The above indirect impacts would not likely affect the regional moose population for reasons similar to those presented at the beginning of the impacts section on grizzly and black bears.

Facilities would be sited to avoid major wildlife travel corridors; therefore, moose movement would not be affected by construction of the new visitor facilities.

Conclusion

From 13 to 45 acres of general moose habitat and from 7 to 36 acres of winter range would be lost as a result of development and related human use. This loss would not be expected to impact moose populations because habitat is abundant throughout the south side. Indirect habitat loss due to displacement would also occur, but would be lower than that under the proposed action and alternative A because the level of development under alternative B would be smaller and more concentrated, attracting fewer visitors. This alternative would not result in a greater potential for moose harassment or moose mortality due to hunting.

WOLVES

Analysis

Under alternative B, wolves would primarily be impacted by the loss of an estimated 13–44½ acres of potential wolf habitat due to facility construction. The loss of this amount of acreage, out of millions of acres of potential wolf habitat on the south side, would probably have little direct impact on wolves. Even the loss of denning habitat would not adversely affect wolf populations, as there are sufficient other sites for dens throughout the planning area.

Factors such as increased noise, vehicle use and human presence associated with the facilities would be minimal under alternative B, as visitation to the south side under this alternative would not increase significantly above existing trends (see socioeconomic impacts). Therefore, provided that developments were not located near active den sites, it is unlikely that wolf populations would endure significant indirect impacts under this alternative.

Conclusion

From 13 to 45 acres of wolf habitat would be lost or disturbed due to facility siting. Development under this alternative would be small-scale, and resulting increases in visitation to the south side would not be significantly above existing trends. The direct and indirect habitat loss from facility siting and associated human use would not significantly impact wolf populations in the area.

TRUMPETER SWANS

Analysis

Like alternative A, the visitor center and related facilities (such as the campground in the central development zone of the state park), would not affect trumpeter swans directly because these facilities would not be sited in swan nesting, brood rearing or molting areas.

Facilities developed under this alternative would not be expected to result in significant increases in visitation above current trends; therefore, indirect impacts on swans would from human activities would not be expected to increase under alternative B. Even so, measures would be taken to would reduce or avoid the potential for swan disturbance.

Conclusion

The development of recreation facilities would not affect trumpeter swans directly because these facilities would not be sited in sensitive swan habitat. Development would be small-scale with insignificant associated increases in visitation; therefore, no indirect impacts on swans (e.g., disturbance by people) would be expected. Additionally, measures would be taken to reduce or eliminate potential disturbance by the few people who do visit the area.

FISH

Analysis

Fishing pressure and the aesthetic value of fishing would not be impacted under alternative B because development would be small-scale and resulting visitation would not increase significantly over current trends.

Fish populations may be impacted indirectly from construction of the facilities and the facilities themselves due to habitat degradation, although because the facilities would be small-scale, the amount of habitat degradation would probably be minor and fish populations would probably not be adversely affected. The precise level of impact on fish habitat from construction activities, facilities, and human use would be determined when site-specific facility design and location details are developed. However, measures would be taken to ensure that impacts remain minimal.

Conclusion

Under this alternative there would be no impacts on local fishing pressure and only potentially minor impacts on fish populations as a result of possible habitat degradation due to facility siting.

THREATENED, ENDANGERED, OR CANDIDATE SPECIES

Analysis

As noted under the analysis of the proposed action and alternative A, it is unknown whether any threatened, endangered, or sensitive species occur on the south side. The American peregrine falcon is the only federally endangered species that may occur, while several federal and state species of concern may be present, as well. Surveys would be completed for each site during subsequent environmental analysis to identify the existence of or critical habitats for these species near proposed development sites and to analyze potential impacts. Consultation with the U.S. Fish and Wildlife Service regarding such species would continue. Measures developed as part of this consultation would ensure that any of these species found to occur in the study area would not be affected by actions taken under alternative B. Therefore, under alternative B, no impacts would be expected on the above listed species or species of concern.

The Tule greater white-fronted geese, considered to be a species at risk by the International Wildfowl Bureau, would not be impacted by actions taken under this alternative. No facilities would be constructed in goose habitat, nor would there be any spin-off development occurring in goose habitat; therefore, no habitat loss would occur. Overall, this alternative would not result in significant increases in visitation above existing trends; thus, no indirect impacts on geese, such as increased disturbance by people, would be expected to result from this alternative.

Conclusion

As with the proposed action and alternative A, no impacts would be expected on listed species or species of special concern because measures would be developed in consultation with the U.S. Fish and Wildlife Service to avoid such impacts. Actions taken under alternative B would not impact the Tule greater white-fronted goose, a species considered at risk by the International Waterfowl Research Bureau, because no facilities would be constructed in goose habitat. Additionally, increases in visitation to the south side due to actions taken under this alternative would not be significant and, thus, would not result in indirect impacts on geese such as increased disturbance by people.

AIR QUALITY

Analysis

Siting of visitor facilities would slightly impact air quality in the vicinity of the developments by increasing levels of pollutants in the air during construction stages. As described in detail under the proposed action, construction-related pollutants include dust, volatile hydrocarbons, and other organic compounds, nitrogen oxides, photochemical oxidants, carbon monoxide, and other types of particulate matter. Increases in these forms of pollution would be intermittent and temporary, lasting only during construction; therefore, no long-lasting effects would be anticipated.

Visitation to the south side would not be expected to increase significantly above existing trends, nor would the corresponding traffic levels. For this reason, no long-term impacts on air quality would be expected.

Conclusion

Conclusion

Siting of visitor facilities would slightly impact air quality in the vicinity of the developments by increasing levels of pollutants (e.g., dust and vehicle emissions) in the air during construction stages. Increases in these forms of pollution would be intermittent and temporary, lasting only during construction. Visitation to the south side would not be expected to increase significantly above existing trends, nor would the corresponding traffic levels. For this reason, no long-term impacts on air quality would be expected from this alternative.

WATER QUALITY

Analysis

South side visitation under alternative B would not increase significantly over current trends; therefore, impacts on water quality would result primarily from construction and siting of visitor facilities, rather than increased human use. These actions could impact water quality by increasing sedimentation and turbidity, altering water flow and hydropatterns, and contaminating the water with pollutants and additional nutrients. The types of impacts under this alternative would be the same as described for the proposed action. The area over which these impacts could occur would be less extensive than under either the proposed action or alternative A. However, facilities would be small-scale and, unlike the proposed action, would not promote widespread access or recreational use on the south side but would instead focus use along the George Parks Highway in Denali State Park. Most water quality impacts would be temporary, lasting only during the construction stages of the developments. Measures would be taken to minimize effects on water quality from construction activities and help prevent long-term impacts on water quality and water-dependent resources.

Alternative B may result in a temporary reduction of water quality due to siting and

construction of visitor facilities. However, these impacts would occur over a smaller area than either the proposed action or alternative A. Impacts related to human use would likely be minimal as visitation would not increase significantly above existing trends. Measures would be taken to minimize effects on water quality and water-dependent resources.

ARCHEOLOGICAL RESOURCES

Analysis

Since site-specific information is not available, the following analysis is based on nearby general survey work (see the "Affected Environment" for further information on archeological resources).

None of the lands on which development would occur has been surveyed for archeological resources. The roadside exhibits along the George Parks Highway would be within the previously disturbed road edge and would not constitute a threat to unknown archeological resources. Trails would be relatively confined developments, and their proposed locations could be adjusted if archeological sites were found before or during trail design.

As noted in the mitigating measures, a survey for archeological resources would be undertaken before precise locations were selected for all developments. Every effort would be made to avoid significant resources during project design. If avoidance was not feasible, mitigating measures would be developed according to 36 CFR 800 in consultation with the Alaska state historic preservation officer, the Advisory Council on Preservation, and Native American groups as appropriate.

The primary focus of development and visitor activity under alternative B would be in the northern, central, or southern development zones of Denali State Park. Five road side pullouts and exhibits would be developed along the George Parks Highway. No trails, campgrounds, or facilities would be developed

Conclusion

Alternative B would not affect any known archeological sites and, if archeological resources were encountered during more detailed site planning or construction, facility relocation or mitigation would provide for acceptable protection.

HISTORIC RESOURCES

Analysis

None of the known historic resources (Windy Creek cabin, Curry Lookout, and the Talkeetna Historic District) would be adversely impacted by the actions taken under this alternative, as no facilities are proposed for these areas and no related increases in recreational use of these sites is expected. However, after consultation with the Alaska state historic preservation office and a search of Alaska Heritage Resource Survey sites in the area, it is evident that placer mining may have occurred near the areas of proposed action. Site survey prior to development should consider the placer mining features typically associated with mining cultural landscapes.

Conclusion

No known historic resources would be affected under this alternative.

SUBSISTENCE

Analysis

on or near Denali National Park lands. No future visitor facilities or services are proposed for Broad Pass or Talkeetna. Therefore, no significant impacts would be anticipated on existing subsistence use activities or populations of fish and wildlife upon which federal subsistence users are dependent.

All rights of access for subsistence harvest on NPS lands are granted by section 811 of ANILCA. The park and preserve are managed according to legislative mandates, NPS management policies, and the *Denali General Management Plan*. No actions under alternative B would affect the access of subsistence users to natural resources in the park and preserve.

As in the proposed action, continued implementation of ANILCA provisions would mitigate any increased competition from resource users other than subsistence users on Denali National Park lands. Therefore, resource competition on parks lands would not be adversely affected under this alternative.

For the same reasons that the proposed action would have little incremental effect on subsistence use in the George Parks Highway corridor, the impacts of a visitor center in the northern, central, or southern development zone would be negligible, especially given the small size of the proposed center (1,500 square feet).

Conclusion

Under alternative B, no significant impacts would be anticipated on existing subsistence use activities or populations of fish and wildlife upon which federal subsistence users are dependent. Access of subsistence users to natural resources should not be affected. Also, resource competition on parks lands would not be adversely affected under this alternative.

MATANUSKA-SUSITNA BOROUGH ECONOMY AND SOCIAL ENVIRONMENT

Analysis

Direct Effects. Visitor center and other park facility construction: Constructing the visitor centers and other park facilities is estimated to cost \$1.8 million (in 1995 dollars). Construction would generate about 11 jobs with estimated earnings of \$0.4 million (in 1991 dollars). It is

A small visitor contact center would be developed in the northern, central, or southern development zone of Denali State Park. A campground with up to 25 units and additional hiking/interpretive trails would also be built alongside the George Parks Highway in Denali State Park. The new visitor center, campground, and roadside trails and exhibits would interact positively with the mountaineering center at Talkeetna and any private hotel development. This alternative would improve visitor access to Denali National Park and Preserve and would encourage reallocation of visitors from the north side of Denali to visitor facilities on the south side of Denali. Increased visitors would include package tour and independent non-Alaska residents and Alaska residents seeking lodging, sightseeing, sports activities, roadside interpretation, and other day use facilities.

Park facilities improvements are estimated to cost \$1.8 million (in 1995 dollars) regardless of the site chosen for the visitor center.

The small visitor center is not expected to result in substantial increases in visitation, but would serve existing or baseline visitors en route to the north side area. Thus, visitor projections were not made to evaluate impacts on the regional economy or for facility space planning.

The estimates of construction outlays is a key element in the analysis of socioeconomic impacts. For purposes of the analysis, economic effects are divided into two categories: direct and indirect/induced. Direct effects result from public construction outlays on goods and services provided by local industries. Indirect/induced effects represent spin-off activities or ripple effects caused by increased direct expenditures within the region. These are estimated using the IMPLAN model.

likely that a significant portion of the jobs and earnings would go to locally hired workers.

Indirect Effects. For alternative B, indirect and total impacts have been projected for facilities construction at 18 and 28 workers with earnings

of about \$0.7 million and \$1.9 million, respectively.

Overview of Socioeconomic Effects

Population and Housing. Population effects from the expansion of visitor facilities at the south side associated with alternative B might include in-migration of NPS and state permanent and seasonal workers (one permanent and two seasonal workers would be required). Also, a few workers might relocate to areas near construction sites during facility construction. Housing would not be provided for NPS or state staff. The available housing stock contains a substantial number of vacant cabins, second homes, or other part-time use residences that may not be available for sale or rent. Sufficient housing would be available from the current stock. However, because of the remoteness of the Denali State Park visitor center location, NPS and state staff and visitor service workers might find it necessary to commute to their jobs from nearby communities.

Economy. Economic benefits from facilities construction and operation would accrue to local residents in the area in the form of jobs and earnings. The construction phase would employ construction workers and require construction equipment, supplies and materials. The operations phase would require hotel maintenance, hospitality, food service, and other workers and park facilities and transportation maintenance personnel and interpretive, recreation, and entertainment staff. Direct, indirect, induced and total impacts would accrue to local residents in the form of increased jobs and earnings as reported above.

There would be modest direct and indirect benefits to Matanuska-Susitna Borough residents from park facilities and employment and income-producing opportunities for local residents. The latter would mostly accrue to residents within easy commute range or located at the sites of new facilities. Most of the impacts would be seasonal, i.e., three to four months

Land Use. While it would be desirable for Matanuska-Susitna Borough to institute land use actions that would restrict and direct development in the vicinity of visitor centers and other park facilities on the George Parks Highway, and thereby protect the major transportation corridor from inappropriate development, the lack of strict land use controls would result in comparatively minor adverse impacts under this alternative. Alternative B would not be expected to stimulate substantial commercial development.

Municipal Services. Public facilities are not likely to require improvements due to alternative B. However, there would be increased requirements for planning, a Matanuska-Susitna Borough areawide service. Nonetheless, impacts on municipal services provided by the Matanuska-Susitna Borough would not be significantly adverse.

Social Environment. Quality of life impacts on residents in the Matanuska-Susitna Borough would be determined by the magnitude of increases in development and visitor use in given areas. Those interested in economic improvement would find encouragement in the form of more jobs and earnings available locally. These would be seasonal, however. The Matanuska-Susitna Borough would perhaps attract other activities to the area through improved land use planning. Development would be higher quality and better organized.

Conclusion

during the summer peak, not year-round. Population and housing impacts would also be modest with only a few seasonal construction workers and permanent and seasonal NPS and state workers who might relocate to the area. Housing impacts would be insignificant; however, due to the remoteness of the potential Denali State Park visitor center location, some

workers might find it necessary to commute to their jobs from nearby communities. Land use impacts would be insignificant under alternative B. Municipal service impacts would also be significant. Quality of life impacts are likely to be beneficial, due to increased opportunities for employment and earnings associated with the project, but insignificant.

TRAPPER CREEK AND PETERSVILLE ECONOMIES AND SOCIAL ENVIRONMENT

Analysis

Construction at any of the development sites in Denali State Park might provide construction employment and income to residents of Trapper Creek community since it is relatively close to the work. NPS and state operations might also provide work and earnings for Trapper Creek community residents, since a few jobs would be available. There would also be spin-off economic benefits to other segments of the Trapper Creek economy, because of housing and other requirements of the workers and other service needs.

Construction and operations of a visitor center under alternative B would not have a significant impact on the Petersville area, due to its remoteness from the potential development sites.

Both communities have relatively large numbers of vacant housing units due to many vacation cabins and/or second homes being located there. Trapper Creek, which is currently experiencing moderate growth in residential development, is especially well-positioned to receive in-migrating workers and their families associated with development under alternative B. Land use impacts would not be significant.

TALKEETNA ECONOMY AND SOCIAL ENVIRONMENT

Analysis

Municipal services in the two communities would not be significantly impacted under alternative B, although there may be some additional demand for ambulance service.

Quality of life impacts owing to development would be beneficial for those seeking jobs and income. However, many residents of the Trapper Creek and Petersville communities have moved there for reasons other than conventional employment opportunities. Some residents are more interested in maintaining a safe, rural, relatively self-sufficient lifestyle afforded by remote living areas. They may view any visitor center development as encroaching urbanization, which they wished to leave behind when they moved to the area.

Conclusion

Trapper Creek could realize some significant economic benefits from constructing and operating a visitor center in the state park. Building the visitor center particularly in the southern development zone in Denali State Park could increase visitation to the community. Most of the impacts would be seasonal, i.e., three to four months during the summer peak, not year-round.

Population and housing and land use impacts would be minimal. Some additional demand for ambulance service might impact community services in Trapper Creek. Some Trapper Creek residents might welcome the increase in visitation to their community; others might object. They might feel that the negative impacts associated with increased traffic-related problems and possible loss of the rural community atmosphere would not be offset by the additional employment and income generated by the development. There would be no significant impacts on the Petersville area.

The small visitor center development under alternative B might draw from the Talkeetna labor force for both construction and operations.

For purposes of analyzing the impacts of the alternative, direct construction and operations of the small visitor center were considered as part of the overall impacts estimated, as discussed above for the Matanuska-Susitna Borough.

Overview of Socioeconomic Effects

Population and Housing. It is unlikely that the Talkeetna population would be impacted significantly under alternative B. Employment and earnings opportunities would be available to local residents and a few would obtain employment. Housing impacts would also be insignificant.

Economy. Jobs and income-growth opportunities from construction and operations of new facilities and from visitor use would benefit Talkeetna residents.

Land Use. There would be little or no land use impacts under alternative B in Talkeetna.

Municipal Services. There would be only modest impacts on municipal services in Talkeetna.

Social Environment. Quality of life impacts resulting from alternative B would be positive for persons seeking jobs and income. Many of Talkeetna's residents have moved there for reasons other than conventional employment opportunities. Some residents are more interested in maintaining a safe, rural, relatively self-sufficient lifestyle afforded by remote living areas. They might view any visitor center development in the south side of Denali National Park and Preserve as encroaching urbanization, which they wished to leave behind when they moved there.

Conclusion

Very modest long-term employment opportunities would be created as part of developing a small visitor contact center under alternative B. There would be minimal impacts on the borough population, housing, and land

Talkeetna residents would benefit modestly from job and income-producing opportunities associated with increased visitation under alternative B. Most of the impacts would be seasonal, i.e., three to four months during the summer peak, not year-round. Population, housing, and land use impacts would be minimal. Municipal services would be impacted only slightly. Quality of life impacts would be improved slightly for persons seeking employment and earnings; they might be viewed as negative by persons who moved to the community to get away from development.

DENALI BOROUGH ECONOMY AND SOCIAL ENVIRONMENT

Analysis

Development of the visitor center facility under alternative B in the northern, central, or southern development zones of Denali State Park might result in some spill-over of economic benefits to the Denali Borough. The fact that the state park is located 40 miles south of the Denali Borough suggests that some of the jobs created at the visitor center would go to residents of the Denali Borough, especially residents of Cantwell. These impacts would be small and insignificant. Population and housing impacts would be minimal as few workers employed as a result of the project would relocate to communities within the borough. Land use and community services impacts would also be negligible. Impacts on the social environment within the borough would be minimal as only a few jobs would be generated locally and only a few permanent and seasonal NPS and state jobs would be taken by borough residents.

Conclusion

use. Quality of life impacts would be positive, but only minor. Most of the impacts would be seasonal, i.e., three to four months during the summer peak, not year-round.

CANTWELL ECONOMY AND SOCIAL ENVIRONMENT

Analysis

The development of a visitor center at a location in the northern development zone of Denali State Park could generate a few jobs and earnings for regional residents. Possibly some of these might be Cantwell residents, which is the closest community to the site. Population and housing impacts would be minimal as few workers employed as a result of the project would be relocated to communities within the community. Land use and community services impacts would also be negligible. Impacts on the social environment within the community would be minimal as only a few jobs would be generated locally and only a few permanent and seasonal NPS and state jobs would be taken by borough residents.

Conclusion

Minimal employment opportunities would be created as part of developing a small visitor center in Denali State Park for which Cantwell residents might qualify. Some indirect benefits would be likely for merchants supplying visitors to the south side visitor center. Most of the impacts would be seasonal, i.e., three to four months during the summer peak, not year-round. There would be minimal impacts on the borough population, housing, and land use. Quality of life impacts would be positive, but not substantial.

VISITOR USE - DENALI STATE PARK AND DENALI NATIONAL PARK AND PRESERVE

Analysis

This alternative also would not result in a substantial increase in recreational use on the south side. Regardless, it is assumed that land managers would work together to manage the recreational use that does occur. If such

Short hiking/interpretive trails or hiking trails would be constructed near the visitor center. No campgrounds would be constructed; however, construction of full-service campgrounds on private lands would be encouraged. The visitor contact center and these roadside and day use facilities would provide opportunities for learning about and experiencing the national and state park attractions and encourage visitors to register for activities (mostly transportation) prior to entering the north side of Denali National Park and Preserve.

Conclusion

Opportunities for existing and future visitors would be expanded due to development of a small visitor contact center and related facilities in Denali State Park, but less than for the proposed action or alternative A.

IMPACTS IF NO LAND USE CONTROLS ARE IMPLEMENTED

As noted, the preceding analysis was based on the assumption that land use controls and other actions to manage uses on the south side would be adopted and implemented prior to initiating the major development associated with this alternative (see the “Elements Common to All Action Alternatives” section). Generally, if no land use controls are implemented, the potential for strip development increases. However, under this alternative, even were no land use controls put in place, it is doubtful there would be spin-off development (see rationale at the beginning of impact discussion of alternative B).

Therefore, effects on the natural, cultural, and socioeconomic values of the south side would be negligible and certainly less than under the proposed action or alternative A.

cooperative efforts were not made, more frequent conflicts between user groups could arise (see

ENVIRONMENTAL CONSEQUENCES

discussion under this section for the proposed action). However, because far fewer people would be attracted to the south side under this alternative, it is expected that the frequency of conflict between user groups would be less than

that which would occur in this situation under either the proposed action or alternative A.

IMPACTS OF ALTERNATIVE C (NO ACTION)

This section provides an analysis of impacts only for those visitor service-related policies and actions that would be taken by the state, National Park Service, or boroughs if none of the action alternatives were approved (see the description of the no-action alternative in the “Alternatives, Including the Proposed Action” chapter for these actions). For a full discussion of other south side actions, refer to the cumulative impacts section in the “Impacts of the Proposed Action.”

Also, unlike the action alternatives, this analysis of the no-action alternative does not assume sufficient land use controls would be implemented and in-place prior to major development.

No spin-off development would be expected to result due to actions taken under this alternative. This is because the incentive for such development would be almost nonexistent. This alternative calls for very few facilities, none of which would be expected to attract a lot of additional visitation to the south side. Therefore, further development of other lands to support new visitors would be unlikely. This conclusion applies to all resources and therefore is not repeated below under each topic.

VEGETATION

Analysis

Construction of a 320-square-foot visitor contact facility in the central development zone of Denali State Park would impact about 1 acre of mixed and deciduous forest.

Conversion of the privately built cabin on Chelatna Lake to public use would not directly impact vegetation at the site as the size of the existing facility would remain the same. Constructing four new public use cabins on the east side of the Chulitna River would result in

the total loss of about 1 acre of mixed and deciduous forest and low and high shrub. Development of trail access to the Chulitna River in the southern development zone of Denali State Park would result in the loss of about ½ acre of mixed and deciduous forest. This figure includes the loss of acreage resulting from construction of an associated parking area for 10 vehicles.

Impacts on vegetation resulting from the few current — and future — recreation users (hikers, backpackers, etc.), including development of social trails, are unknown but assumed to be minor.

Brushing and vista clearing along the George Parks Highway would cause the disturbance or loss of an unknown amount of vegetation.

Matanuska-Susitna Borough land near the Forks Roadhouse on the Petersville Road is being reviewed for possible development of a snowmachine parking area. Although the size and design of this parking area have not yet been determined, it is expected to be large enough to accommodate the number of snowmachiners that use the area currently. For the purpose of this analysis, it is assumed the parking area would have space for about 100 vehicles with trailers capable of carrying at least two snowmachines each. Therefore, about 4 acres of vegetation could be lost due to construction of this parking area. Furthermore, indirect impacts on vegetation (e.g., abrasion, pollution-related effects) could result if the parking lot attracts increased numbers of snowmachiners to the south side.

Overall, considering that the vegetation classes extend over several million acres in the south side study area, the loss of the above amount of vegetation would not be considered a significant impact.

Conclusion

A minimal amount (about 7 acres) of vegetation would be lost or disturbed by state- and borough-constructed developments under this alternative. Considering that the vegetation classes extend over several million acres in the south side study area, the loss of this amount of vegetation is not considered a significant impact.

GRIZZLY AND BLACK BEARS

Analysis

The analysis that follows discusses both direct and indirect impacts. Although alternative C would create new developed and dispersed use areas, it is expected that resulting indirect impacts would not significantly affect regional bear populations on the south side because developed and dispersed areas would be very minimal and focused along the George Parks Highway, leaving most of the south side relatively free of human development and use. In general, indirect impacts would be similar in magnitude to those occurring under alternative B.

Habitat Loss and Bear Displacement. About 7 acres of general grizzly and black bear habitat would be lost due to developments carried out on state land under alternative C.

The indirect loss of bear habitat due to displacement would be minimal. Few if any bears would be displaced from habitat in the vicinity of the developments, as these facilities would be very small in scale and attract few additional visitors to the area, with the possible exception of snowmachiners. However, even if the number of snowmobilers on the south side increases as a result of the new parking area, this increase would likely have only a minimal effect on bears as, throughout most of the snowmachining season, bears would be in their dens.

A minor amount of general grizzly and black bear habitat would be lost or disturbed under

Overall, because bear habitat is abundant on the south side (there are at least a half-million acres within the study area), the loss of habitat resulting from actions taken by the state and borough under this alternative is not expected to impact black or grizzly bear populations.

Confrontations and Human Injury. South side visitation in general would not increase as a result of actions taken under this alternative; therefore, the probability of bear/human confrontations and human injury would remain minimal. Furthermore, it is assumed that appropriate bear management practices would be instituted at public use cabins and other facilities to minimize the possibility of bears becoming accustomed to finding food at these locations (a situation that could lead to confrontations between bears and humans).

Although sized to accommodate existing use, it is expected that the parking facility near the Forks Roadhouse would likely attract increased snowmachiners to the area. However, the impact on bear/human confrontations and human injury is expected to be minimal as, throughout most of the snowmachining season, bears would be in their dens.

Bear Mortality and Harassment. The number of bears killed due to management actions or defense of life and property situations would increase slightly under this alternative because of the new developments. Bear mortality from hunting would increase slightly as a result of the new snowmachine parking area facilitating the access of hunters on snowmachines during the spring hunting season when bears begin emerging from their dens. Poaching and harassment of bears may increase as well, but the increase would likely be minimal.

Conclusion

this alternative as a result of facility siting, and few if any bears would be displaced due to the

loss. Bear populations would not be affected substantially because bear habitat is abundant throughout the south side and because the facilities would be small scale, attracting relatively few additional visitors to the area. The probability of bear/human confrontations and human injury would be minimal, as would the potential for poaching and harassment of bears. Bear mortality would increase slightly due to facilitated access of hunters on snowmachines during the spring hunting season.

CARIBOU

Analysis

Caribou generally do not use the area inside Denali State Park; therefore, the visitor contact station and trail in the central development zone would not have any adverse impacts on caribou. For the same reason, the conversion of the private cabin at Chelatna Lake to a public use cabin would also not impact caribou.

Conclusion

No adverse impacts on caribou populations would result under this alternative.

MOOSE

Analysis

About 3 acres of general and winter moose habitat would be lost due to construction on state land of developments carried out under alternative C.

Few if any moose would be displaced from habitat in the vicinity of the developments, as these facilities would be very small in scale and attract few additional visitors to the area; therefore, the indirect loss of moose habitat due to displacement would be minimal.

Construction by the Matanuska-Susitna Borough of a parking area near the Forks

Roadhouse on the Petersville Road would eliminate 4 acres of general and winter moose habitat. Assuming that the parking area would attract greater numbers of snowmachiners to the area, the potential for displacement or harassment of moose could be increased slightly. Moose mortality due to hunting would not be affected by this action, because hunting season would be closed by the time snowmachiners are able to access the area.

Overall, because moose habitat is abundant on the south side (there are several hundred thousand acres of moose habitat on the south side), the loss of habitat is not expected to impact moose populations. The minor increases in moose mortality and harassment would adversely impact individual moose, but would not likely affect populations for reasons similar to those discussed under impacts on grizzly and black bears.

Conclusion

About 7 acres of general and winter moose habitat would be lost or disturbed under this alternative as a result of facility siting. However, this loss would not substantially impact moose populations because such habitat is abundant throughout the south side. Displacement of moose from winter habitat and moose harassment may increase slightly above current levels, but mortality from hunting would not be expected to be affected.

WOLVES

Analysis

An estimated 3 acres of wolf habitat would be lost due to facility construction on state land under this alternative. An additional 4 acres of habitat would be lost directly if a parking facility for snowmachines were constructed near the Forks Roadhouse along the Petersville Road. The loss of this habitat, out of millions of acres of potential wolf habitat on the south side,

would probably not have a direct impact on wolves.

Increased snowmachine use resulting from construction of the new snowmachine parking area could displace wolves from habitat, but such impacts probably would not be substantial. With the increased human presence in the vicinity of the Forks Roadhouse, encounters between wolves and people also may be slightly more frequent, potentially causing an equally small increase in wolf mortality. This would impact individual wolves, but would not be expected to affect the wolf population as a whole.

Conclusion

About 7 acres of wolf habitat would be lost or disturbed. Habitat loss from actions taken under this alternative would not significantly impact wolf populations in the area. Individual wolves may be adversely affected to a small degree by increased human presence in the vicinity of the Forks Roadhouse, although again, no significant impacts on regional wolf populations would be expected.

TRUMPETER SWANS

Analysis

Depending on siting details, about 7 acres of potential swan habitat could be lost or disturbed due to construction of facilities under this alternative. The east side of the Chulitna River has historically been the site of nesting swans as has the area of Denali State Park near the George Parks Highway bridge. Although no swans have been sighted near the roadhouse, the forested wetlands in the vicinity are considered preferred habitat.

Indirect impacts on swans from human activities may be expected to increase slightly under this alternative, particularly if human access to sensitive swan habitat is facilitated by the new facilities. For example, the addition of the snowmachine parking facility in the vicinity of

the Forks Roadhouse could improve access for snowmachines, potentially leading to the disturbance of swans. Swans begin arriving on the south side in the spring when ice begins to thaw and water bodies open up. Where snow depth allows, snowmachiners may continue to recreate in spite of the swans' arrival and the noise and activity of snowmachiners could disturb swans. In Denali State Park, snowmachining is restricted when swans arrive; therefore, no impacts on swans would result from increased snowmachine access to the state park.

Conclusion

There may be a loss of a minor amount (about 7 acres) of potential swan habitat under this alternative, depending on where facilities were sited. Indirect disturbance of trumpeter swans may rise slightly due to increased human presence in the vicinity of these developments.

FISH

Analysis

Construction of trail access to the Chulitna River in the southern development zone would lead to increased access to the river by anglers. These actions may increase fishing pressure slightly, potentially adversely impacting the aesthetic quality of fishing this portion of the river for some people. The Alaska Fish and Game has the authority to enforce regulations to prevent over-fishing where necessary; therefore increased numbers of anglers would not be expected to impact fish populations directly.

Fish populations may be impacted indirectly from construction of the facilities and the facilities themselves due to habitat degradation, although, because the facilities would be minimal, the amount of habitat degradation would probably be minor and fish populations would not likely be adversely affected. The

precise level of impact on fish habitat from construction activities, facilities, and human use cannot be determined without site-specific facility design and location details.

Trail development to the Chulitna River may increase local fishing pressure slightly, potentially adversely impacting the aesthetic experience of fishing for some visitors. Impacts on fish populations from habitat degradation resulting from developments under this alternative would likely be minor.

THREATENED, ENDANGERED, OR SENSITIVE SPECIES

Analysis

The Tule greater white-fronted goose, considered to be a species at risk, uses wetlands along the Petersville Road. Construction of the snowmachine parking area in the vicinity of the Forks Roadhouse, and associated increased human use in this area, may result in the direct loss of goose habitat (depending on where the parking lot is sited) or cause geese to temporarily or permanently abandon habitat if disturbed by humans during sensitive periods. Such impacts, however, would likely be minor.

Impacts would on other species would be the same as described for the proposed action.

Conclusion

As with the action alternatives, no impacts would be expected on listed or species of special concern. Actions taken under this alternative may minimally impact the Tule greater white-fronted goose (a species considered at risk by the International Waterfowl Research Bureau), due to habitat loss and disturbance from construction of visitor facilities and associated use.

AIR QUALITY

Conclusion

Analysis

Siting of visitor facilities would slightly impact air quality in the local vicinity of the facilities by increasing levels of pollutants in the air during construction stages. Construction-related pollutants include dust, volatile hydrocarbons and other organic compounds, nitrogen oxides, photochemical oxidants, carbon monoxide, and other types of particulate matter. Increases in these forms of pollutants would be intermittent and temporary, lasting only during construction; therefore, no long-lasting effects would be anticipated areawide, but could have more substantial localized impacts where vehicles are concentrated.

Neither south side visitation nor corresponding traffic levels would be expected to increase above existing trends as a result of actions taken by the state under this alternative. However, development of a snowmachine parking area by the Matanuska-Susitna Borough near the Forks Roadhouse would likely increase visitor use and traffic levels in this area. Increased snowmobile use would adversely impact local air quality to a minor degree. It is expected, however, that the air quality impacts of this action would be negligible compared to the impacts of other existing or future south side actions (see discussion of air quality impacts in the “Impacts of the Proposed Action” section for further explanation).

Conclusion

Siting of visitor facilities would slightly impact air quality in the local vicinity of the facilities by increasing levels of pollutants in the air during construction stages. Increases in these forms of pollution would be intermittent and temporary, lasting only during construction and having no long-lasting effects. Construction of a parking area near the Forks Roadhouse would

likely have only minimal temporary impacts on air quality, but use of the parking lot could have minor localized impacts because vehicles would be concentrated there.

Construction and siting of visitor facilities, as well as associated recreational use, could impact water quality by increasing sedimentation and turbidity, altering water flow and hydro patterns, and contaminating the water with pollutants and additional nutrients. The types of impacts under this alternative would be the same as described for the proposed action. The area over which these impacts would occur would be less extensive than the proposed action, however, being focused along the George Parks Highway, near the Forks Roadhouse along the Petersville Road, and near Chelatna Lake. Most water quality impacts would be temporary, lasting only during the construction stages of the developments.

Conclusion

The types of impacts on water quality would be the same as described for the action alternatives, but the magnitude would be less. Overall, impacts on water quality would be minimal and mostly temporary, lasting during construction of visitor facilities.

ARCHEOLOGICAL RESOURCES

Analysis

Impacts would be the same as the proposed action. None of the lands on which development would occur have been surveyed for archeological resources. However, every effort would be made to avoid significant resources during project design. If avoidance was not feasible, mitigating measures would be taken in compliance with state and local statutes regarding archeological resources which would provide acceptable protection.

WATER QUALITY

Analysis

Conclusion

There would be no impacts on any known archeological sites, and if archeological resources were encountered during more detailed site planning or construction, mitigation would provide for acceptable protection.

HISTORIC RESOURCES

Analysis

None of the known historic resources (Windy Creek cabin, Curry Lookout, and the Talkeetna Historic District) would be adversely impacted by actions taken under alternative C, as no facilities are proposed for these areas and no related increases in recreational use of these sites is expected.

Conclusion

No known historic resources would be affected under this alternative.

SUBSISTENCE

Analysis

There would be no impacts on subsistence users or on subsistence resources under the no-action alternative.

Conclusion

Subsistence users and subsistence resources would not be affected.

MATANUSKA-SUSITNA BOROUGH ECONOMY AND SOCIAL ENVIRONMENT

There would be minor improvements to visitor facilities and services provided by the state of Alaska. These include construction of a 320-square-foot visitor contact facility adjacent to the Alaska Veterans Memorial, development of a public use cabin at Chelatna Lake, possible development of trail access to the Chulitna River in the distant future, and development of four public use cabins on the east side of the Chulitna River in Denali State Park. The visitor contact facility could provide information services; however, they would be minimal and passive. Users of the public use cabin at Chelatna Lake would be confined to the lake shore or face a difficult climb through heavy brush to alpine areas, as no trails would be built in the area.

These state of Alaska improvements to public and private visitor facilities and services would have minor positive economic impacts, i.e., increase employment and incomes of area residents who provide services to visitors because of enhanced visitor experience, which would serve to stimulate visitor growth, albeit at a small rate.

Matanuska-Susitna Borough land near the Forks Roadhouse on the Petersville Road has been identified in the corridor management plan currently under development for the area as a winter parking area for snowmachiners. This land management action, if implemented, would have a positive economic impact on employment and income in the Petersville area due to the expansion of recreational opportunities and consequent growth in visitation to the area. It also would reduce roadside parking along the Petersville Road. Adverse impacts on the human environment conditions could result from expanded and uncontrolled snowmachine use because of increased noise, air pollution, and potential wildlife habitat damage.

Conclusion

Analysis

There would be minimal direct and indirect income effects from increased spending on lodging, transportation, food, fuel, etc. in the Matanuska-Susitna Borough. These would be less under this alternative than under any of the action alternatives. This is because only minor additions to publicly provided visitor facilities or services would be developed.

DENALI BOROUGH ECONOMY AND SOCIAL ENVIRONMENT

Analysis

Actions taken under this alternative would have minimal to no economic impacts on Denali Borough or communities therein, as neither the state, Denali Borough, nor the National Park Service would develop additional visitor service-related facilities in this area.

Conclusion

There would be minimal or no economic impacts on the Denali Borough or communities therein resulting from the no-action alternative.

VISITOR USE - DENALI STATE PARK AND DENALI NATIONAL PARK AND PRESERVE

Analysis

Visitation to Denali State Park would be expected to continue on the basis of past trends, with increases in total visitors amounting to about 3.5% per annum. Most of the visitors would be Alaska residents as has been the case historically. The few facilities provided by the state, boroughs or National Park Service under alternative C would not support this growing south side visitation. Instead, most visitor services and facilities on the south side would

be provided by major commercial interests, primarily to meet the needs of package tourists. Visitor facilities would not be developed under a planned approach, but instead would be provided in an unstructured, incremental manner. Under alternative C, many visitors would be attracted to the south end of the state park and the Petersville Road area due to the existing facilities at Byers Lake and the modest improvements in visitor services and recreational opportunities made under this alternative by the state and the Matanuska-Susitna Borough. Visitor access to the south side of Denali National Park and Preserve would remain extremely limited, and would be mostly associated with the NPS mountaineering center in Talkeetna.

facilities developed under this alternative. Land owned by Matanuska-Susitna Borough near the Forks Roadhouse has been identified by the borough as a potential parking lot for snowmachine users in the Petersville Road corridor management plan, which is currently being prepared. Visitation would be increased by these developments as well as by normal increases in Alaska population associated with economic growth and statewide increases in visitation.

Interpretive and recreational opportunities for future visitors would be similar to those at present, with a minimal number of new public

Conclusion

Interpretive and recreational opportunities for future visitors would be similar to those at present, with a minimal number of new public

CONSULTATION AND COORDINATION

CONSULTATION AND COORDINATION FOR THE 1993 DRAFT DEVELOPMENT CONCEPT PLAN / ENVIRONMENTAL IMPACT STATEMENT, SOUTH SLOPE

For this planning effort the National Park Service published a notice of intent to prepare an environmental impact statement in the Federal Register, volume 56, no. 75, page 15931 on April 18, 1991. The expressed intent was to evaluate the impact of expanding visitor activities and facilities on the south side of the Alaska Range and to examine a series of alternatives for (1) providing visitor access to and within the park/preserve, and (2) providing additional visitor information and services.

In July 1991 the National Park Service distributed a scoping letter to the public and affected agencies. The letter was an early solicitation to the public to become involved in the planning effort and requested they provide the Park Service their issues and concerns about the possibility of developing additional facilities on the south side. A total of 142 letters were received from individuals, public interest groups, businesses, and the state of Alaska in response to that request. Most letter comments focused on the proposal to construct a visitor center and the possibility that it might be located near Talkeetna. In addition to the letters, the National Park Service received four petitions signed by a total of about 890 Talkeetna visitors, residents, and business owners. The signers of the petitions opposed location of a visitor center in Talkeetna by about a 4:1 ratio.

In February 1992 the National Park Service distributed an alternatives workbook that solicited public input on conceptual draft alternatives for the development concept plan and provided a postage-paid response form for reviewers. The workbook presented four draft alternatives that ranged from no action to an alternative that would construct two visitor centers, 15 roadside exhibits, 184 miles of trails, and six new public use cabins. A total of 407 workbook response forms were returned. In addition to the response forms, 239 individual letters and 1,507 preprinted post cards were

received. As in the response to the scoping letter, most of these responses focused on the proposed visitor center near Talkeetna.

About 1,400 copies of a *Draft South Slope Development Concept Plan / Environmental Impact Statement* were distributed to the public in June 1993. The closing date of the public review period for this document was initially September, but was extended to November 1, 1993. Eight public meetings were held during the review period to discuss the document. The purpose of the public meetings was to receive oral or written testimony on the draft DCP/EIS. The meetings provided a brief introduction to the development concept plan and the environmental impact statement process. Testimony by the public was generally not restricted by scope or length. Transcripts of the meetings were not made, but the August meetings were recorded and, during all meetings, each substantive comment was manually noted for the individual testifying.

A total of about 150 people attended public meetings held in August 1993 (Anchorage, Talkeetna, Denali National Park and Preserve, and Fairbanks), while about 110 people attended the meetings held in October (Talkeetna, Trapper Creek, Fairbanks, and Cantwell). The number of people testifying at each meeting is given below.

Anchorage meeting (August 25, 1993);
8 people provided testimony

Talkeetna meeting (August 26, 1993);
20 people provided testimony

Denali National Park and Preserve meeting
(August 27, 1993); 17 people provided
testimony

Fairbanks meeting (August 28, 1993);
8 people provided testimony

Fairbanks meeting (October 11, 1993);
no testimony given

Talkeetna meeting (October 12, 1993);
22 people provided testimony

Trapper Creek meeting (October 13, 1993);
no formal statements given; this was a
question and answer session

Cantwell meeting (October 14, 1993);
8 people provided testimony

A total of 396 letters were received from the public during the four-month comment period. In addition, 603 pre-formatted postcards were received from individuals indicating opposition or support for the proposed action.

COORDINATION WITH THE STATE OF ALASKA AND MATANUSKA-SUSITNA BOROUGH

In November 1991 the NPS planning team held an interagency workshop in Anchorage to develop alternatives for the development concept plan. Included in the three-day workshop were the chief of planning for Alaska State Parks, a park ranger from Denali State Park, and a planner from

Matanuska-Susitna Borough. After the workshop the National Park Service presented the alternatives to various state agencies and adjusted the alternatives based on comments received from them. This presentation occurred in December 1991 and included representatives from the following offices: Alaska Departments of Natural Resources (including the Division of Parks and Outdoor Recreation), Transportation and Public Facilities, Environmental Conservation, and Fish and Game, as well as the Division of Tourism. It also included an individual from the Denali Citizen's Advisory Commission.

COORDINATION WITH THE U.S. FISH AND WILDLIFE SERVICE

In March 1991 pursuant to National Park Service policy and guidelines and in compliance with section 7 of the Endangered Species Act, the Park Service requested from the U.S. Fish and Wildlife Service information on federally listed or candidate, threatened, or endangered plant and animal species that might occur within the south side planning area of the development concept plan. At that time, the U.S. Fish and Wildlife Service indicated that, based on their information, no listed species were present in the planning area.

**CONSULTATION AND COORDINATION FOR THE 1996 REVISED DRAFT
AND FINAL DEVELOPMENT CONCEPT PLAN / ENVIRONMENTAL
IMPACT STATEMENT, SOUTH SIDE**

The National Park Service published a notice of intent to prepare a revised draft development concept plan and environmental impact statement for the south side of Denali National Park and Preserve in the *Federal Register*, volume 60, no. 206, page 54705.

Public issues and concerns regarding south side planning were identified during the scoping process for the 1993 draft DCP/EIS and were carried over to the 1996 revised draft DCP/EIS. Recommendations for the south side, provided by the Denali Task Force in its 1994 report to the National Park System Advisory Board, provided a basis for potential visitor services and facilities to consider in a revised draft DCP/EIS. Additional public input also was solicited as part of developing the revised draft DCP/EIS. Public input was obtained through distribution of a newsletter and through a series of public open houses. The newsletter, published on August 11, 1995, provided an update on Denali National Park and Preserve planning, including planning for the south side. It included a brief description of preliminary ideas for south side visitor facilities and services, invited written comments from the public on these ideas, and announced the dates and locations of public open houses to discuss and obtain feedback on these ideas and to solicit additional suggestions. Several public open houses were held to update the public on these planning efforts. The open houses were announced in the newsletter and in a notice in local newspapers. They were held the last two weeks in August in the communities of Fairbanks, Cantwell, Healy/Denali Park, Anchorage, Talkeetna/Trapper Creek, and Wasilla/Palmer. With regard to the south side, a new proposed action and two other development alternatives were presented to the public for comment and discussion. Other items related to past or current planning for the south side, including copies of the 1994 Denali Task Force

report, were also provided at this time as background material.

On March 25, 1996, the National Park Service published a notice in the *Federal Register* announcing the availability of the revised draft DCP/EIS (volume 61, no. 58, pages 12095-12096). The document was made available to the public the week of March 17, 1996; approximately 1,300 copies were distributed.

The revised draft DCP/EIS was a product of a cooperative partnership between six major landowners and managers on the south side: the state of Alaska, the Denali and Matanuska-Susitna Boroughs, Ahtna, Inc., Cook Inlet Region Inc., and the National Park Service. As part of this planning process, the cooperative planning partners attended five cooperative planning meetings in Anchorage (May 23, June 30, July 28, September 13, October 12, and December 8, 1995). In addition to these formal meetings, the partners engaged in a number of informal meetings and telephone discussions to further exchange ideas and information about the south side.

Public hearings on the revised draft DCP/EIS were held in several Alaskan communities in the spring of 1996. A total of about 330 people attended the hearings held in April (Fairbanks, Healy, Cantwell, Trapper Creek, Talkeetna, and Anchorage) and in May (Wasilla). The number of people testifying at each meeting is given below.

Fairbanks meeting (April 16, 1996); 6 people provided formal testimony

Healy meeting (April 17, 1996); 3 people provided formal testimony

Cantwell meeting (April 18, 1996); 4 people provided formal testimony

Trapper Creek meeting (April 23, 1996); 16 people provided formal testimony
Talkeetna meeting (April 24, 1996); 28 people provided formal testimony

Anchorage meeting (April 25, 1996); 21 people provided formal testimony

Wasilla meeting (May 15, 1996); 19 people provided testimony.

The closing date of the public review period for this document was initially May 21, 1996, but was extended to June 5, 1996. During the review period about 480 written comments (letters, postcards, and statements) were received from agencies, interest groups, businesses, and individuals. All letters with substantive comments received on the revised draft have been reprinted in volume 2 of this document, with responses printed alongside the letters for easy reference. Volume 2 also contains excerpted comments from testimony given at the seven public hearings. The original letters are available for review at Denali National Park and Preserve, as well as at the National Park Service in Anchorage. Copies of the complete transcript for each public hearing are available for review at the Talkeetna Library and at the offices of Denali National Park and Preserve, the National Park Service in Anchorage, and the Alaska Division of Parks and Outdoor Recreation in Anchorage.

COORDINATION WITH THE U.S. FISH AND WILDLIFE SERVICE

In August 1995, pursuant to NPS policy and guidelines and in compliance with section 7 of the Endangered Species Act, the National Park Service requested from the U.S. Fish and Wildlife Service information on federally listed plant and animal species that might occur within the south side planning area for the development concept plan. A response was received on October 6, 1995 (see appendix J), stating that one endangered species and five species of concern may occur in the project area. A copy of the revised draft DCP/EIS was sent to the

agency under separate cover on April 2, 1996. In a response dated December 16, 1996, the U.S. Fish and Wildlife Service said that they understand that the plan is very conceptual and will require additional planning and investigation. They agreed with the conclusion that until specific surveys are done, it cannot be determined if, or to what degree, listed species would be affected by the proposed development (see appendix J).

COORDINATION WITH THE ALASKA STATE HISTORIC PRESERVATION OFFICE AND THE WESTERN OFFICE OF THE ADVISORY COUNCIL ON HISTORIC PRESERVATION

The National Park Service has consulted with the Alaska State Historic Preservation Office (SHPO) and the Western Office of the Advisory Council on Historic Preservation since the initiation of this project. A copy of the 1996 revised draft DCP/EIS was sent to both of these offices in order to initiate and plan for coordination of survey, eligibility, effect, and mitigation of possible cultural resources in the proposed project areas early in the planning process. Copies of the revised draft DCP/EIS were sent to the SHPO and the advisory council under separate cover on April 4, 1996; no response letters were received. Telephone communications between Tim Smith, SHPO, and Nancy Swanton, Denali National Park and Preserve, on September 12, 1996, confirmed that the SHPO has no concerns or comments regarding this conceptual plan, but would like to stay informed of any future site-specific plans that may follow this DCP/EIS.

**LIST OF AGENCIES, ORGANIZATIONS, AND BUSINESSES TO WHOM COPIES
OF THE 1993 DRAFT, 1996 REVISED DRAFT, OR FINAL DEVELOPMENT
CONCEPT PLAN/ENVIRONMENTAL IMPACT STATEMENT WERE SENT**

FEDERAL AGENCIES

Advisory Council on Historic Preservation
Department of the Interior
 Bureau of Land Management, Anchorage
 Special Assistant to the Secretary for Alaska
 U.S. Fish and Wildlife Service, Anchorage
Department of Transportation, Federal
 Highway Administration, Vancouver,
 Washington
Environmental Protection Agency, Seattle
 Washington

STATE AGENCIES

Department of Fish and Game
Department of Transportation and Public
 Facilities
Division of Parks and Outdoor Recreation
Division of Tourism
State Historic Preservation Office
Office of the Governor
Office of Management and Budget, Division
 of Governmental Coordination

**LOCAL AGENCIES AND NATIVE
ORGANIZATIONS**

Alaska Federation of Natives
Ahtna, Incorporated
City of Fairbanks
Cook Inlet Region, Incorporated
Denali Borough
Matanuska Susitna Borough, Planning
 Department
Municipality of Anchorage

OTHER ORGANIZATIONS

Alaska Center for the Environment
Alaska Miners Association
Alaska Railroad Corporation
Alaska Visitors Association
Alaska Wilderness Studies, University of
 Alaska, Anchorage
Alaska Wildlife Alliance
Concerned Citizens of Talkeetna
Denali Citizen's Council
Greater Fairbanks Chamber of Commerce
Greater Palmer Chamber of Commerce
National Outdoor Leadership School
National Parks and Conservation
 Association
Resource Development Council for
 Alaska, Inc.
Sierra Club, Alaska Field Office
Talkeetna Chamber of Commerce, Inc.
Talkeetna Community Council
Talkeetna Environmental Center
Talkeetna Historical Society
Talkeetna Open Door Committee
The Wilderness Society
Trapper Creek Community Council

APPENDIXES / BIBLIOGRAPHY / PREPARERS / INDEX

**APPENDIX A: SUMMARY OF DENALI TASK FORCE RECOMMENDATIONS
FOR THE SOUTH SIDE, 1994**

General South Side Recommendations: New Denali-oriented destinations are needed, especially on the underutilized south side, to take advantage of outstanding recreational and mountain viewing opportunities. An array of visitor services is needed to serve both tour groups and independent travelers. No one site can meet all objectives and opportunities for south side development. New development must be accompanied by planning and land use actions to ensure protection of scenic, primitive, and wildlife values of the state and national parks and minimize uncontrolled strip development. Some or all visitor centers should be operated cooperatively with the state. At least one should be accessible to the Alaska Railroad. Specific size and location is dependent on demand, recreational opportunities, and natural resource constraints. No commercial lodging should be provided on public lands, although small-scale ancillary food service may be appropriate (e.g., Tokositna). Visitor centers and major access improvements should be at least partially funded through federal sources due to the national park orientation. Trail recommendations focus on short interpretive trails, especially in the vicinity of visitor centers, and trails that provide access to the national park and/or alpine terrain.

Tokositna: Modest visitor center in Denali State Park near Long Point, about 3 miles from the national park boundary. Excellent view in national park caliber alpine setting. Site requires substantial upgrade and 6–7 mile extension of the 40-mile-long Petersville Road. Related facilities: campground, cabins, short interpretive trails, trail access to national park.

Talkeetna: Mountaineering-oriented visitor information/interpretive site. Has road, rail and air access. Supports existing and future private development. Related facilities: Local trails, river recreation, private lodging.

Byers Lake: Small visitor center along the George Parks Highway in the vicinity of Byers Lake in Denali State Park. Site is centrally located to high quality recreational opportunities and does not involve land acquisition costs or conflicts with adjacent private lands. Expand existing campground.

Broad Pass: Good location for private recreation facilities on private, borough or non-park state land. Accessible by road, rail and air. If the private sector develops this area, a small park resource protection and multi-agency visitor contact center is recommended. Use of the Dunkle Hills road for hiking access, possible bus tours. Related facilities: trailheads.

Chelatna Lake: Fly-in recreation site on state land at Chelatna Lake, including one or more public use cabins, kiosk with interpretive information, and a trail through dense vegetation to alpine terrain and national park lands.

Scenic Highway or Corridor Designation for Portions of the George Parks Highway and/or Railroad: Implement highway right-of-way restrictions, e.g., setback requirements, vegetative screening frontage roads and billboard restrictions. Improve roadside pullouts, interpretive signing, and selected brushing to improve views. Develop self-guided interpretive brochures.

Watchable Wildlife: Establish corridors.

APPENDIX B: STATEMENT OF COOPERATION

APPENDIX C: LEGAL MANDATES, REGULATORY REQUIREMENTS, AND POLICIES

This planning effort is related to several legal mandates, regulatory requirements, and policies. The most significant of these are summarized below.

Local

Corridor Management Plans. The Matanuska-Susitna Borough is developing two corridor management plans as part of its ongoing planning efforts. These plans seek to balance the use, enjoyment, and economic opportunities of the borough's scenic highways. The borough is developing corridor management plans for the George Parks Highway (Talkeetna Spur to northern borough boundary) and the Petersville Road (entire length). Future plans will address the Denali Highway and segments of the Glenn Highway. The corridor management plans will allow the affected communities to consider the various ways of using and benefiting from the scenic highway corridor while developing management guidelines to maintain the integrity and values of the highway.

The corridor management plans are developed by a process similar to the manner used by the borough in updating its comprehensive plan. A planning team composed of residents of the affected community and users of the highway assist in developing the plan. These individuals develop the goals and priorities for how the highway is to be managed and develop the recommendations for management guidelines. The management guidelines may include a variety of measures including: vegetative buffers, road design criteria, pullout identification, zoning, conveyance language, etc. The planning effort includes public participation in the form of public meetings where the plan is discussed and comments received and through formal public hearings by both the Borough Planning Commission and Assembly. Both the plan and the method(s) in which it is implemented must be adopted by ordinance.

A.S. 29.35.210 Municipal Powers and Duties. The Matanuska-Susitna Borough is a second class borough. The borough's legal authority is delegated from the state in accordance with Alaska Statute 29.35.210. The borough has authority to produce and implement land use plans and land use regulations, develop and maintain transportation systems, provide for animal control and pollution control, emergency services, recreation programs, and to provide waste

management. Second class status also provides the borough with a variety of other powers relative to the conduct of business, land use, and protection of the quality of life of its residents. Not all of these powers are currently being exercised by the borough.

MSB 1.10.115 Planning and Zoning, MSB 15, MSB 16, MSB 17. MSB 1.10 sets out the responsibility of the borough for planning, platting, and zoning on an area wide basis. MSB 15 Planning, MSB 16 Platting, and MSB 17 Zoning, provide detailed standards and procedures for implementing those powers.

Comprehensive land use planning is conducted by a public process. Final decisions are made by the borough assembly. The comprehensive plan is composed of a variety of component plans including but not limited to transportation, recreation, schools, public facilities, coastal management, and land use. The land use plan is composed of an older (1970) comprehensive plan which is being updated on a community by community basis. The land use plan also incorporates some state plans such as the *Susitna Area Plan* and *Willow Sub Basin Plan* for state owned land in the borough. Planning goals and objectives are pursued through capital projects, operational funding and regulations. Land use regulations are a primary tool to implement the requirements of approved plans. Borough Land Use Regulations must be consistent with the stated goals and objectives of an adopted Land Use Plan.

MSB 17.17 Denali Special Land Use District. The area of the Denali State Park including privately owned inholdings are subject to the Land Use Standards of MSB 17.17 Denali Special Land Use District. This district is designed to encourage land use that will be compatible with the character of the Denali State Park and to provide for appropriate economic development.

Other MSB Ordinances. A variety of other borough-wide ordinances are also effective within the planning area any may affect specific land uses based upon type and location. They include but are not limited to MSB 5 Service Areas, MSB 8 Health and Welfare, MSB 11 Roads, Streets, Sidewalks and Trails, MSB 19 Schools, MSB 23 Real Property, and MSB 24 Animal Control.

Over the time frame of this plan, it is anticipated that the extension of land use regulations and other borough codes will occur as necessary to implement those community comprehensive plans approved by the borough assembly.

State

Denali State Park Legislation. Denali State Park was created by the Alaska Legislature in 1970 and enlarged in 1976 (Alaska Statutes 41.21.150-152). The park is managed by the Alaska Department of Natural Resources Division of Parks and Outdoor Recreation (DOPOR). The current *Denali State Park Master Plan* was adopted by DOPOR in 1989, and is expected to be updated in 1997.

Land Management Statutes and Plans. The Alaska Department of Natural Resources (ADNR) manages state-owned lands and resources under Titles 38 and 41 of the Alaska Statutes. ADNR, in cooperation with the Alaska Department of Fish and Game (ADFG) and the Matanuska-Susitna Borough, completed the *Susitna Area Plan* in 1985. The *Susitna Area Plan* provides management guidelines for state-owned public domain lands adjacent to Denali State Park and the south side of Denali National Park. In 1991, ADNR, with the assistance of the ADFG, the cooperation of the Matanuska-Susitna Borough, and assistance from the National Park Service, adopted the *Susitna Basin Recreation Rivers Management Plan* to guide management of six legislatively designated recreation rivers and adjacent river corridors, including the Deshka River (Kroto Creek/ Moose Creek) and Lake Creek.

Fish and Wildlife Management Statutes and Responsibilities. Under Title 16 of the Alaska Statutes, the ADFG is responsible for the management, protection, and maintenance of fish and wildlife resources. Also under Title 16, the Alaska Board of Fisheries and the Alaska Board of Game develop the regulations governing fishing, hunting, and trapping, including the establishment of seasons, limits, methods, and means of harvest.

Highway Management Statutes and Responsibilities. Under Title 19 of the Alaska Statutes, the Alaska Department of Transportation and Public Facilities is responsible for the planning, construction, maintenance, protection, and control of state-owned roads and associated rights-of-way, including the George Parks Highway, the Petersville Road, and the Dunkle Hills Road.

Federal

National Park Service Organic Act of 1916. The NPS Organic Act created the National Park Service to promote and regulate the use of a system of federal parks “which purpose is to conserve the scenery and natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for future generations.”

The Wilderness Act of 1964. This act designated about two million acres of Denali National Park and Preserve as wilderness. The Wilderness Act requires federal agencies to administer these areas to provide for their use and enjoyment, now and in the future, and to protect and preserve their wilderness character.

National Historic Preservation Act of 1966, as amended. This act declared a national policy of historic preservation. Together with its implementing regulations, it establishes the National Register of Historic Places, creates the Advisory Council on Historic Preservation, and provides further considerations for national historic landmarks. Section 106 requires the lead federal agency for a federally assisted, permitted, or licensed undertaking to take into account the effects of the undertaking on properties included in or eligible for the National Register of Historic Places. Further, Section, 106 requires consultation with the state historic preservation officer (SHPO) and provides for the Advisory Council on Historic Preservation to comment.

National Environmental Policy Act of 1969. The purpose of this act is to declare a national policy that will encourage productive and enjoyable harmony between man and his environment; to promote efforts that will prevent or eliminate damage to the environment and biosphere and to stimulate the health and welfare of man; to enrich the understanding of the ecological systems and natural resources important to the nation; and to establish a Council on Environmental Quality. To ensure that federal agencies meet the intent of NEPA, the act established several “action forcing” provisions, including a requirement for preparation of an environmental impact statement. See “NEPA Process” for details on these provisions and on the NEPA process.

Alaska Native Claims Settlement Act of 1971 (ANCSA). This act established native shareholder corporations and enabled them to make applications for land selections. ANILCA, section 906 (a), provides that at such time as the entitlement of any Native Corporation to land under the Alaska Native Claims Settlement Act is satisfied, any land within a conservation unit selected by such Native Corporation shall, to the extent that such land is excess of its entitlement, become part of such unit and administered accordingly.

Endangered Species Act of 1973. The purpose of this act is to provide protection for animal and plant species that are currently in danger of extinction (endangered) and those that may become so in the foreseeable future (threatened). Section 7 of the Endangered Species Act requires federal agencies to ensure that all federally associated activities within the United States do not have adverse impacts on the continued existence of threatened or endangered species or on designated areas (critical habitats) that are important in conserving those species. Action agencies must consult with the U.S. Fish and Wildlife Service (USFWS) to determine the potential impacts a project may have on protected species. The USFWS has established a system of informal and formal consultation procedures.

Executive Orders for Wetlands and Floodplains of 1977. Executive Order 11988, "Floodplain Management" (1977) requires federal agencies to reduce the risk of flood loss, minimize the impact of floods on human safety, health, and welfare, and restore and preserve the natural and beneficial values served by floodplains in carrying out agency responsibility. Executive Order 11990, "Protection of Wetlands", (1977) requires federal agencies to "... avoid to the extent possible the long- and short-term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative."

Alaska National Interest Lands Conservation Act of 1980 (ANILCA). ANILCA expanded the former Mount McKinley National Park by about 4 million acres, including most of the land on the south side of the Denali massif, and officially renamed the area as Denali National Park and Preserve. In Section 202 (3)(a), Congress directed that these lands should be managed "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."

Several other sections of ANILCA affect planning for the south side. Section 810 requires the evaluation of potential restrictions to subsistence activities that could result from authorizing certain actions such as development on Denali's south side. Section 1306 directs the Secretary of the Interior to consider using Native-owned lands for locating federal facilities if the use of such lands is desirable and practical. Section 1307 permits commercial visitor services that existed prior to 1979 to continue. It also provides a preference for Native corporations and local residents in establishing new visitor services. Section 1308 establishes a program to encourage hiring local residents with special knowledge and expertise concerning the national and cultural resources of the park.

1990 Senate Appropriations Committee Directive.

A 1990 congressional appropriations committee directive (Senate Report 101-534, p. 538) gave the following direction to the planning effort:

The Committee notes that efforts have been ongoing since 1986 to develop a comprehensive plan for visitor facilities in the southern portion of Denali National Park and Preserve. In conjunction with the State of Alaska, the Service [National Park Service] should complete design and concept plans for visitor facilities in Talkeetna, Alaska and in Denali State Park and should develop a plan for related facilities including campgrounds, trailheads, and cabins. The committee expects the Service to complete this planning work in a timely manner. The Service should provide the Committee with cost estimates for completion of the facilities by May 1, 1991.

The National Park Service completed the cost estimate for comprehensive design of a visitor center in Talkeetna and submitted it to Congress in May 1991. The Talkeetna visitor center considered in the draft DCP/EIS provided the basis for that cost estimate.

National Park Service Management Policies.

Pertinent NPS *Management Policies* direct the

Place management emphasis on minimizing human impacts on natural animal population dynamics;

Identify and promote the conservation of all federal candidate species within park boundaries and identify and map distributions for all species considered rare in a park;

Work cooperatively with others to “anticipate, avoid, and resolve potential conflicts, to protect park resources, and to address mutual interests in the quality of life for community residents, considering economic development as well as resource and environmental protection”; and

Encourage people to come to the parks and pursue inspirational, educational, and recreational activities related to the resources found in these special environments and to provide, through the use of concessions, those commercial facilities and services within the parks necessary for visitors’ use and enjoyment.

National Park Service to:

Rehabilitation Act of 1973 (As Amended in 1978), Title V, Section 504. This act states that “no otherwise qualified handicapped individual in the United States...shall, solely by reason of his handicap, be excluded from the participation in, be denied the benefits of, or be subjected to discrimination under any program or activity conducted by an executive agency or by the United States Postal Service.”

Americans With Disabilities Act (ADA) of 1990. The ADA broadens protection of people with disabilities. It gives civil rights protections and guarantees equal opportunities for the disabled individuals in areas of employment, public accommodations, transportation, state and local government services, and telecommunications.

United Nations Man and the Biosphere Program. Denali National Park and Preserve is a designated biosphere reserve and is recognized internationally as a significant example of the subarctic ecosystem. This designation emphasizes the importance of protecting the park’s natural processes and genetic diversity for comparison with areas that have been altered by human activities.

APPENDIX D: ANILCA SECTION 810 – SUBSISTENCE STATEMENT

ANILCA Section 810(a) Summary Finding

I. INTRODUCTION

Section 810 of ANILCA requires that proposed actions within Alaska's national parks address their potential to impact the area's legally permitted federal subsistence users. This analysis does not evaluate State authorized subsistence use and activities on adjacent private, borough, or state lands.

This section was prepared to comply with Title VIII, section 810, of the Alaska National Interest Lands Conservation Act (ANILCA). It summarizes the evaluations of potential restrictions to subsistence activities that could result from authorizing recreation developments on the south side of the Alaska Range within Denali National Park and Preserve. The *South Side Final Development Concept Plan/Environmental Impact Statement* describes a range of alternatives for consideration.

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;

The proposed action would authorize construction of the following trails within Denali National Park boundary: (1) developing short trails in the Tokositna

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

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

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."

The potential for significant restriction must be evaluated for the proposed action's effect on "subsistence uses and needs, the availability of other lands for the purposes sought to be achieved and other alternatives that would reduce or eliminate the use."

III. PROPOSED ACTION ON FEDERAL LANDS

Proposed Action

area of Denali State Park through shrub vegetation to alpine terrain in Denali National Park; (2) developing a trail through shrub vegetation from state land on

Chelatna Lake to alpine terrain in Denali National Park; and (3) establishing a trailhead along the Dunkle Hills road to improve access into Denali National Park, pending resolution of land status issues.

The primary focus of activity and actions under the proposed alternative would take place on state, borough, and private lands outside Denali National Park and Preserve boundaries. The following proposed actions would be implemented in phases as the need and funds become available:

- In the Tokositna area of Denali State Park, a visitor center (up to 5,000 square feet) would be built. Additionally, a campground of up to 50 sites, a picnic area, up to four public use cabins, and several short hiking/ interpretive trails would be developed in this area.
- If needed in the future, a visitor center (up to 3,000 square feet) would be constructed in the central development zone of Denali State Park. Also, based on need and opportunity, visitor facilities, and services may be developed at Talkeetna and Broad Pass.
- The Byers Lake campground would be expanded by 25 sites, or a new campground of up to 50 sites would be built in the central development zone of Denali State Park.
- Five roadside pullouts and interpretive signs would be developed along the George Parks Highway.
- In the Chelatna Lake area, up to five primitive fly-in only campsites would be constructed, as well as up to two public use cabins, a short hiking/interpretive trail and trailhead interpretive sign.
- The Dunkle Hills road could provide new public access opportunities in the Dunkle Hills/Broad Pass area for hiking, biking, and mining-related interpretation once land status issues are resolved. A trailhead along the road at or near the national park boundary would provide improved access to Denali National Park and Preserve.

Alternative A

All facilities would be located in Denali State Park along the George Parks Highway. No development would occur on Denali National Park lands. No facilities would be constructed in the Tokositna and Chelatna Lake areas. No public use cabins would be

constructed. No future visitor facilities and services are proposed for the Talkeetna and Broad Pass areas. Alternative A would consist of the following:

- One visitor center (up to 13,000 square feet) would be built in either the northern, central, or southern development zones of Denali State Park.
- The Byers Lake campground would be expanded by 25 sites, or a new campground of up to 50 sites would be built in the central development zone of Denali State Park.
- Short hiking/interpretive trails would be developed around the visitor center.
- Five roadside pullouts and interpretive signs would be developed along the George Parks Highway.

Alternative B

All facilities would be located in Denali State Park along the George Parks Highway. No development would occur on Denali National Park lands. No facilities would be constructed in the Tokositna and Chelatna Lake areas. No public use cabins would be constructed. No future visitor facilities and services are proposed for the Talkeetna and Board Pass areas. Alternative B would consist of the following:

- a small visitor center (up to 1,500 square feet) would be built in either the northern, central, or southern development zone of Denali State Park.
- Short hiking/interpretive trails would be developed near the visitor center.
- A campground of up to 25 sites would be constructed along the George Parks Highway.
- Five roadside pullouts and interpretive signs would be developed along the George Parks Highway.

Alternative C

No new public facilities would be constructed, with the exception of the following actions:

- a 320-square-foot visitor contact facility would be built adjacent to the Alaska Veterans Memorial at Byers Lake.

- Over the long term, some trail access to the Chulitna River could be provided in the central development zone of Denali State Park to implement the state park master plan.
- Matanuska-Susitna Borough land near the Forks Roadhouse on the Petersville Road is being reviewed for possible development of a snowmachine parking lot and sanitary facilities.
- The Alaska Division of Land, with financial assistance from the National Park Service, would continue its project to convert an existing privately built cabin near Chelatna Lake to public use.

Management activity and the current low level of backcountry visitation would continue.

A full discussion of alternatives, development scenarios, and anticipated effects can be found in the *Development Concept Plan/Environmental Impact Statement*.

IV. AFFECTED ENVIRONMENT

A summary of the affected environment pertinent to subsistence use is presented here. For a comprehensive description, see the "Affected Environment" chapter of this document. Other documents contain additional descriptions of the environment of Denali National Park and Preserve:

Final Environmental Impact Statement, Wilderness Recommendation, Alaska Planning Group, 1988.

Denali National Park and Preserve, Final General Management Plan, Land Protection Plan. Alaska Regional Office, National Park Service, 1986.

The south side study area lies within the boundaries of wildlife management units 13E, 14B, 16A and 16B within the 1980 ANILCA park additions of Denali National Park and Preserve.

Subsistence uses are allowed within the 1980 additions to Denali National Park and Preserve in accordance with Titles II and VIII of ANILCA. Section 202(3)(a) of ANILCA authorizes subsistence uses within the new additions to Denali National Park, where such uses are traditional. Lands within former Mount McKinley National Park are closed to subsistence uses. The 1980 additions to Denali National Preserve are open for federally-authorized subsistence use and state-authorized general hunting and fishing.

Resident zone communities for Denali National Park and Preserve are Cantwell, Lake Minchumina, Nikolai, and Telida. Local rural residents of these communities are eligible to pursue subsistence activities in the 1980 park and preserve 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 and preserve additions may continue to do so pursuant to a subsistence permit issued by the park superintendent in accordance with federal law and regulations.

About 320 local rural residents qualify for subsistence use activities within Denali National Park and Preserve. About 161 subsistence users reside in the south side study area, of which, about 151 reside in the Cantwell vicinity.

Federal subsistence use on the south side of Denali National Park and Preserve occur primarily, if not exclusively, on national park lands in the Board Pass region, and secondarily, on national preserve lands in the Yentna River drainage.

South side subsistence users depend largely on moose, caribou, ptarmigan, spruce grouse, hare, and a few species of freshwater fish. Large mammals account for 70% of the resources used, and fish account for 21%. Marten, mink, red fox, wolf, lynx, weasel, wolverine, land otter, beaver, muskrat, and coyote are important fur animal resources.

The National Park Service recognizes that patterns of subsistence use vary from time to time and from place to place depending on the availability of wildlife and other renewable natural resources. A subsistence harvest in a given year may vary considerably from previous years because of weather, migration patterns, and natural population cycles.

V. SUBSISTENCE USES AND NEEDS EVALUATION

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

- 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 effect the action might have on subsistence fisherman or hunter access
- the potential for the action to increase fisherman or hunter competition for subsistence resources

Evaluation of the Proposed Action

(1) The potential to reduce populations

The primary focus of development and visitor activity would be in the Tokositna overlook area between the Peters and Dutch Hills within Denali State Park. And secondarily, along selected development zones along the George Parks Highway and Alaska Railroad systems from Talkeetna to Broad Pass. Additionally, for fly-in use at Chelatna Lake.

No federal subsistence use is known to occur on Denali National Park lands within the Chelatna Lake region, Dutch and Peters Hills region, or the upper Tokositna drainage. Increased recreational use in these regions is not expected to cause a reduction in numbers of, or a redistribution of, subsistence resources.

The only development occurring on Denali National Park land under the proposed action would be several short trails from the Tokositna overlook site to alpine terrain within Denali National Park, and a trail from state land on Chelatna Lake to alpine terrain within Denali National Park. The extent of the trail system inside the national park would be very limited. A small amount of vegetation would be impacted by trail construction. Considering the large extent of vegetation in the planning area and the limited nature of these trails, it will not cause a significant impact on wildlife habitat, and its potential to reduce important subsistence wildlife populations is minimal.

The proposed action recommends providing new public access opportunities in the Dunkle Hills/Broad Pass area for hiking, biking, and mining-related interpretation once land status issues are resolved. A trailhead along the road at or near the national park boundary would provide improved access to Denali National Park and Preserve. Human use of the Dunkle Mine trail and the Dunkle Hills during the spring and early summer is unlikely to impact the Denali caribou herd's use of the south side calving grounds at present caribou population levels; however, if the Denali caribou population returns to historic levels, adverse impacts during this sensitive calving/post-calving

(3) Increase in competition

period could be significant, unless all human use of the Dunkle Hills is restricted during calving and post calving periods.

Nearly all of Denali National Park's south side subsistence users reside in the Cantwell and upper Chulitna River region. Windy Creek, Cantwell Creek, Bull River, and Dunkle Hills are important subsistence resource use areas within Denali National Park. The primary subsistence use activity is moose and caribou hunting which occurs from August through September, a time period which coincides with popular recreation visitation. Improved access to the Dunkle Hills area, pending resolution of land status issues, would result in increased subsistence use of the Dunkle Hills. With improved access during the fall hunting season, moose and caribou populations have the potential to be adversely impacted by increased subsistence use. The Federal Subsistence Board and the National Park Service may mitigate impacts on wildlife populations through adjustments to seasons and bag limits, regulating modes of access, and implementing closures. Long-term impacts on populations would not be expected.

Increased recreational use of the Dunkle Hills during summer and fall months may cause the temporary displacement of moose and caribou populations resulting in subsistence users having to travel farther to locate animals. This potential recreational disturbance is not expected to cause lasting redistribution of wildlife populations or result in reduced populations.

It is anticipated that increasing visitor use and sport fishing in the Dunkle Hills area has the potential to impact fish populations. However, NPS regulations and provisions of ANILCA provide the tools for adequate protection for fish and wildlife populations on Federal Public lands while ensuring a subsistence priority for local rural residents.

(2) Restriction of access

All rights of access for subsistence use on NPS lands are granted by section 811 of ANILCA. The park and preserve are managed according to legislative mandates, NPS management policies, and guidelines in the approved *Denali General Management Plan*. No actions under the proposals, which are described in detail in the environmental impact statement, would affect the access of subsistence users to natural resources within the park and preserve.

National park lands are not open to sport hunting. No increase in competition for subsistence hunting is expected on park lands in the proposal area. National park and preserve lands are open to sport and subsistence fishing. Visitor use activity in the Dunkle Hills and Broad Pass area could increase the competition for subsistence fish resources. However, NPS regulations and provisions of ANILCA mandate that if and when it is necessary to restrict taking of fish, subsistence users are the priority consumptive users on federal public lands and would be given preference on such lands over other consumptive uses (ANILCA, section 802(2)).

Continued implementation of the ANILCA provisions would mitigate any increased competition from resource users other than subsistence users. Therefore, the proposed action is not expected to adversely affect resource competition. If the increase in visitors and population growth in local communities is monitored to ensure that steps can be taken to mitigate any impacts that might occur, the proposed action would not significantly affect subsistence activities and resources used for subsistence purposes.

Evaluation of Alternatives A and B

(1) The potential to reduce populations

The primary focus of development and visitor activity under alternatives A and B would be in the southern, central, or northern development zones of Denali State Park. Five roadside pullouts and exhibits would be developed along the George Parks Highway under both alternatives. No trails, campgrounds, or facilities would be developed on or near Denali National Park lands. No future visitor facilities or services are proposed for Broad Pass or Talkeetna. Therefore, no significant impacts are anticipated on existing subsistence use activities or populations of fish and wildlife upon which federal subsistence users are dependent.

(2) Restriction of access

All rights of access for subsistence harvest on NPS lands are granted by section 811 of ANILCA. The park and preserve are managed according to legislative mandates, NPS management policies, and the *Denali General Management Plan*. No actions under alternatives A and B, which are described in detail in the DCP/EIS, would affect the access of subsistence users to natural resources in the park and preserve.

(3) Increase in competition

As in the proposed action, continued implementation of ANILCA provisions would mitigate any increased competition from resource users other than subsistence users on Denali National Park lands. Therefore, alternatives A and B are not expected to adversely affect resource competition on park lands.

VI. AVAILABILITY OF OTHER LANDS

Other lands outside the park and preserve have been considered and incorporated into the proposed action. The proposed action is consistent with NPS mandates. No major impact on subsistence uses is expected under the proposed action.

VII. ALTERNATIVES CONSIDERED

The evaluation has described and analyzed the alternatives of this DCP/EIS, with emphasis on the proposed action.

VII. FINDINGS

This analysis concludes that the proposed action would not result in a significant restriction of subsistence users.

APPENDIX E: DEVELOPMENT COST ESTIMATES

Following are development cost estimates for the proposed action and the alternatives as of 1996. Most cost estimates are rough NPS "class C" estimates based on the average cost of similar facilities constructed in Alaska (adjusted for Denali National Park and Preserve) through federal government contracts. Actual costs may be higher or lower depending on the final design, site conditions, and the contracting agency. Facilities may be constructed by the National Park Service, the state of Alaska, or some other entity such as a private or nonprofit corporation. Gross construction includes net government contract costs, construction supervision, and contingencies (net construction+31%). Construction planning includes surveys, more detailed site planning, facility design, construction documents, and additional project compliance activities (25% of net).

Most facility costs were developed using the NPS/Denver Service Center cost estimating data base. Some figures were adjusted using data provided

by the Alaska System Support Office and Denali National Park and Preserve staff. Certain facilities, such as cabins, would be developed using "off the shelf" plans and "day labor" construction and therefore are not identified for design, construction supervision, and contingency costs. The Tokositna area road upgrading cost estimates were provided by the Alaska Department of Transportation and Public Facilities. The state estimates that the gross construction costs could range from \$32 million to \$36 million (includes bicycle enhancements) depending on the final road design standards used. The \$36 million figure is used in the following table to be conservative. The state uses about 10% for project supervision and contingencies and estimates about \$3 million for design and compliance needs on this road project.

These estimates are intended primarily to assist in comparing the relative cost of alternatives. Some figures may not add up due to rounding.

PROPOSED ACTION: DEVELOPMENT COSTS

Area	Gross Constr. Cost	Construction Planning	Total Cost
Tokositna			
Upgrade 22-mile access road	\$36,000,000	\$3,000,000	\$39,000,000
Visitor center (5,000 sq. ft.)	1,310,000	250,000	1,560,000
Interpretive media (1,000 sq. ft.)	328,000	63,000	391,000
Visitor center furnishing (15% of net vis. ctr. cost)	197,000	38,000	235,000
Landscape development (25% of net vis. ctr. cost)	328,000	62,000	390,000
Parking (45 cars)	118,000	22,000	140,000
Oversize parking (30 buses/RVs)	275,000	52,000	327,000
Campsites (50)	118,000	22,000	140,000
Campground toilets (2 large vault)	118,000	22,000	140,000
Picnic shelter (1,500 sq. ft.)	114,000	22,000	136,000
Public use cabins (4 @ 400 sq. ft., without water)	160,000	0	160,000
Vault toilet for public use cabins (2 small)	26,000	5,000	31,000
Employee cabins (5 @ 200 sq. ft., without water)	100,000	0	100,000
Employee shower house (500 sq. ft.)	147,000	28,000	175,000
Onsite water system	288,000	55,000	343,000
Wastewater treatment system	288,000	55,000	343,000
Electric generation system	164,000	31,000	195,000
Trails (assume 5 miles)	200,000	0	200,000
Subtotal	\$40,279,000	\$3,727,000	\$44,006,000
Byers Lake			
Visitor center (3,000 sq. ft.)	\$786,000	\$150,000	\$936,000
Interpretive media (400 sq. ft.)	131,000	25,000	156,000
Visitor center furnishing (15% of net vis. ctr. cost)	118,000	22,000	140,000
Landscape development (25% of net vis. ctr. cost)	196,000	38,000	234,000
Parking (25 car)	66,000	12,000	78,000
Oversize parking (15 bus/RV)	138,000	26,000	164,000
Onsite water system	98,000	19,000	117,000

Area	Gross Constr. Cost	Construction Planning	Total Cost
Wastewater treatment system	98,000	19,000	117,000
Electric generation	118,000	22,000	140,000
Campground addition (50 sites)	118,000	22,000	140,000
Campground toilets (2 large vault)	118,000	22,000	140,000
Access road (assume 2,000 lin. ft.)	524,000	100,000	624,000
Trails (assume 3 miles)	120,000	0	120,000
Subtotal	\$2,629,000	\$477,000	\$3,106,000
Chelatna Lake			
Primitive campsites (5)	\$ 13,000	\$2,000	\$ 15,000
Public use cabins (2 @ 400 sq. ft., without water)	80,000	0	80,000
Vault toilet (small)	10,000	0	10,000
Trails (assume 3 miles)	120,000	0	120,000
Subtotal	\$223,000	\$2,000	\$225,000
Dunkle Hills			
Trailhead (10 cars, gravel) - Subtotal	\$ 20,000	\$ 4,000	\$ 24,000
Interpretive Roadside Exhibits			
Media and shelters (2) - Subtotal	\$44,000	\$8,000	\$52,000
Proposed Plan Total	*\$43,195,000	**\$4,218,000	***\$47,413,000

* Net construction costs plus supervision and contingencies

** Design/compliance costs

*** Total gross development costs

ALTERNATIVE A: DEVELOPMENT COSTS

Area	Gross Const. Costs	Construction Planning	Total Costs
Visitor center (13,000 sq. ft.)	\$3,406,000	\$650,000	\$4,056,000
Interpretive media (2,000 sq. ft.)	655,000	125,000	780,000
Visitor center furnishing (15% of net vis. ctr. cost)	511,000	98,000	609,000
Landscape development (25% of net vis. ctr. cost)	852,000	162,000	1,014,000
Parking (60 cars)	157,000	3,000	187,000
Oversize parking (40 buses/RVs)	367,000	70,000	437,000
Onsite water system	288,000	55,000	343,000
Wastewater treatment system	288,000	55,000	343,000
Electric generation	164,000	31,000	195,000
Access road (assume 2,000 lin. ft.)	524,000	100,000	624,000
Trails (5 miles)	200,000	0	200,000
Campground addition (50 sites)	118,000	22,000	140,000
Campground toilets (2 large vault)	118,000	22,000	140,000
Subtotal	\$7,648,000	\$1,470,000	\$ 9,068,000
Interpretive Roadside Exhibits			
Media and shelters (2) - Subtotal	\$44,000	\$8,000	\$52,000
Alternative A Total	\$ 7,581,000	\$1,458,000	\$9,120,000

ALTERNATIVE B: DEVELOPMENT COSTS

Area	Gross Const. Costs	Construction Planning	Total Costs
Denali State Park Development Zone Near George Parks Highway			
Contact station (1,500 sq. ft.)	\$393,000	\$75,000	\$468,000
Contact station furnishing (15% of net cont. stn. cost)	59,000	11,000	70,000
Landscape development (25% of net cont. stn. cost)	98,000	19,000	117,000
Parking (20 cars)	52,000	10,000	62,000
Oversize parking (10 buses/RVs)	92,000	18,000	110,000
Onsite water system	79,000	15,000	94,000
Wastewater treatment system	59,000	11,000	70,000
Electric generation	98,000	19,000	117,000
Access road (assume 2,000 lin. ft.)	524,000	100,000	624,000
Trails (assume 5 miles)	200,000	0	200,000
Campground addition (25 sites)	59,000	11,000	70,000
Campground toilet (1 large vault)	59,000	11,000	70,000
Subtotal	\$1,772,000	\$300,000	\$2,072,000
Interpretive Roadside Exhibits			
Media and shelters (2) - Subtotal	\$44,000	\$8,000	\$52,000
Alternative B Total	\$1,816,000	\$308,000	\$2,124,000

APPENDIX F: STAFFING, OPERATION, AND MAINTENANCE COST ESTIMATES

ASSUMPTIONS AND COMMENTS

The following staffing and cost figures are rough estimates based on a number of assumptions about conceptual plans and locations. They are subject to change as sites are chosen, design decisions are made, plans are finalized, and a better understanding of facility operation requirements is gained. The staffing titles listed below are state position descriptions except where position titles are preceded with "NPS" (National Park Service). This does not mean the position will be filled only by state (or NPS) employees; whether the state, the National Park Service, or the private sector provides the staffing is a decision to be made in subsequent negotiations.

Costs will vary depending on the operating season. These initial estimates assume full operation of all campgrounds and visitor centers from around June 1 through September 30, and limited operation of the Tokositna Visitor Center during the winter. Full operation of the visitor centers is defined as being open to the public 12 hours per day, 7 days per week. Operating seasons of some facilities may be extended in the future.

Snow removal will be provided only in the shoulder seasons to prolong the late summer use or enable early thaw at the beginning of the summer season. Costs will vary depending on whether services (including provision of related employee housing) are privately contracted or provided by state or federal employees or volunteers.

In addition to the operating costs in this appendix, initial one-time equipment and gear purchases would be necessary. Some examples include ranger pickup trucks, snowmachines, search and rescue equipment, radios, and uniform items. These purchases would likely be funded through a separate capital appropriation. Under the proposed action, an additional road grader or truck-mounted snow blower would need to be purchased depending on whether the upgraded/extended Petersville Road were operated seasonally or year-round, respectively.

PROPOSED ACTION: STAFFING COSTS

Position (at full build-out)	Number	Appointment	Total Estimated Salary Per Year
Park Ranger II	1	seasonal (8 months)	\$32,080
Park Ranger I	1	year-round	41,904
Park Ranger I	1	seasonal (8 months)	27,936
NPS Biological Technician	1	seasonal (5 months)	16,000
NPS Backcountry Ranger	2	seasonal (4 months)	15,900
Maintenance Worker I	1	year-round	45,000
Laborer	1	seasonal (6 months)	26,000
Natural Resource Technician II (Interpretation/Information Services)	6	seasonal (6 months)	110,628
Park Volunteers	2 8	year-round seasonal (5 months)	7, 200 8, 000
Total	24	--	\$330,648

PROPOSED ACTION: OPERATION AND MAINTENANCE

Facility/Operation (at full build-out)	Estimated Total Cost Per Year
Additional maintenance for upgraded/extended Petersville Road	\$127,650
Utilities (water, sewer, heat, electricity, phone)	150,000
Janitorial maintenance contracts, supplies, materials	80,000
Vehicles, air charters	45,000
Snowplowing (seasonal)	10,000
Emergency repairs	20,000
Visitor center interpretive equipment, exhibit upkeep, supplies, materials, etc.	20,000
Trail maintenance	10,000
Total Cost	\$462,650

ALTERNATIVE A: STAFFING COSTS

Position (at full build-out)	Number	Appointment	Total Estimated Salary Per Year
Park Ranger II	1	year-round	\$48,120
Park Ranger I	1	year-round	41,904
NPS Biological Technician	2	seasonal (5 months)	32,000
NPS Backcountry Ranger	2	seasonal (4 months)	15,900
Maintenance Worker I	1	seasonal (8 months)	30,000
Natural Resource Technician II	4	seasonal (6 months)	73,752
Park Volunteers	1 5	year-round seasonal (5 months)	3,600 5,000
Total	17	--	\$250,276

ALTERNATIVE A: OPERATIONS AND MAINTENANCE

Facility/Operation (at full build-out)	Estimated Total Cost Per Year
Utilities (water, sewer, heat, electricity, phone)	\$100,000
Janitorial maintenance contracts, supplies, materials	60,000
Vehicles, air charters	35,000
Snowplowing (seasonal)	10,000
Emergency Repairs	10,000
Visitor center interpretive equipment, exhibit upkeep, supplies, materials, etc.	10,000
Trail maintenance	5,000
Total Cost	\$230,000

ALTERNATIVE B: STAFFING COSTS

Position (at full build-out)	Number	Appointment	Total Estimated Salary Per Year
Park Ranger I	1	year-round	\$ 41,904
Maintenance Worker I	1	seasonal (8 months)	30,000
NPS Biological Technician	2	seasonal (5 months)	32,000
NPS Backcountry Ranger	2	seasonal (4 months)	15,900
Natural Resource Technician II	3	seasonal (6 months)	55,314
Park Volunteers	5	seasonal (5 months)	5,000
Total	14	--	\$180,118

ALTERNATIVE B: OPERATIONS AND MAINTENANCE

Facility/Operation (at full build-out)	Estimated Total Cost Per Year
Utilities (water, sewer, heat, electricity, phone)	\$ 70,000
Janitorial maintenance contracts, supplies, materials	30,000
Vehicles, air charters	25,000
Snowplowing (seasonal)	5,000
Emergency Repairs	10,000
Visitor center interpretive equipment, exhibit upkeep, supplies, materials, etc.	10,000
Trail maintenance	5,000
Total Cost	\$155,000

ALTERNATIVE C (NO ACTION)

There would be costs related to the rapid growth of winter activities, as noted in the "Issues and Impact Topics" section; there would also be the need to manage Denali State Park on a year-round basis. At present, the state park is only managed

seasonally, with one seasonal state Park Ranger II. This position would change to year-round, increasing salary costs from about \$28,120 to \$48,120 per year. This change is reflected in the table on staffing below. Operation and maintenance costs are also presented below. All costs shown are minimums.

ALTERNATIVE C: STAFFING COSTS

Position	Number	Appointment	Total Estimated Salary Per Year
Park Ranger II	1	year-round	\$48,120
Total	1	--	\$48,120

ALTERNATIVE C: OPERATIONS AND MAINTENANCE

Facility/Operation	Estimated Total Cost Per Year
Utilities (water, sewer, heat, electricity, phone)	\$15,000
Snowplowing (seasonal)	2,000
Trail maintenance	2,000
Total Cost	\$19,000

APPENDIX G: ANILCA SECTIONS 1306 AND 1307 IMPLEMENTATION SUBUNIT GUIDELINES

**APPENDIX H: ALASKA DEPARTMENT OF FISH AND GAME
MANAGEMENT SUBUNIT BOUNDARIES**

GMSU 13E: Bounded by a line beginning at Talkeetna, then north along the Chulitna River to its confluence with the Tokositna River, then turning west and north along the Tokositna River to the Tokositna Glacier, then north to the Alaska Range and east along the Alaska Range to the community of Windy, then east to the Susitna Glacier then southerly along the glacier and the Susitna River to the mouth of Kosina Creek, then up Kosina Creek to its headwaters, then across the divide and down Aspen Creek to the Talkeetna River, then westerly along the Talkeetna River to the community of Talkeetna, the point of beginning.

GMSU 14B: Bounded on the west by the Susitna River from its junction with Willow Creek to Talkeetna, on the north and east by the Talkeetna River, on the south by a line from the head of the Chickaloon River to the head of Peters Creek, then Willow Creek to its junction with the Susitna River, the point of beginning.

GMSU 16A: Bounded on the west by the Yentna River from its mouth upstream to the Kahiltna River, then north along the Kahiltna River and Kahiltna Glacier to the Alaska Range, then south and east to the Tokositna Glacier and along the Tokositna River to its confluence with the Chulitna River, then south along the Chulitna River to Talkeetna, then south along the Susitna River to the mouth of the Yentna River, the point of beginning.

GMSU 16B: Bounded on the east by the Yentna River from its mouth upstream to the Kahiltna River, then north along the Kahiltna River and Kahiltna Glacier to the Alaska Range, then southwest along the Alaska Range to Rainy Pass, continuing south to Merrill Pass, then southeast to Redoubt Volcano, then east and north along Cook Inlet to the community of Alexander, then along the Susitna River north to the mouth of the Yentna River, the point of beginning.

APPENDIX I: WILDLIFE HABITAT MAPS

Included in this appendix are habitat maps for grizzly (brown) bear, black bear, moose, and caribou. These maps are based on information from the following sources: the *Environmental Investigation and Site Analysis for Tokositna, Denali State Park* (ADNR 1980), the *ADFG Habitat Management Guide for the Southcentral Region* (ADFG 1985a), the *Susitna Area Plan* (ADNR 1985), the *Denali State Park Master Plan* (ADNR 1989), and observations of wildlife biologists and south side hunting/ fishing/ backcountry/rafting guides.

It should be noted that, although these maps were created using the best available information, data on wildlife concentrations on the south side, particularly

bear and moose, are extremely limited and it is therefore unlikely that the maps describe the true distribution of these species. Additionally, the maps are drawn at a large scale and because of this some of the polygons depicting seasonal concentrations encompass a greater area than that actually used by the animal. For example, moose generally seek calving areas where predator densities are low (islands in rivers) or there is improved visibility (open muskegs). However, such areas are too small to be displayed on these large-scale maps; therefore, the polygons representing calving concentrations cover a much broader area which includes islands and open muskegs, but may also include other areas where cows don't generally calve.

Map (*INSERT 3 WILDLIFE MAPS FROM DEIS*)

Map

Map

**APPENDIX J: ENDANGERED SPECIES CONSULTATION
WITH U.S. FISH AND WILDLIFE SERVICE**

APPENDIX K: VISITOR PROJECTION METHODOLOGY

Prepared by Reed Hansen, Reed Hansen and Associates

This section provides an explanation of the assumptions and methodology used to develop visitor projections under each of the alternatives in the *South Side Development Concept Plan/Environmental Impact Statement*. Visitor projections are based on several assumptions that may or may not hold true in the future.

SOUTH SIDE VISITOR DEMAND

Visitor demand for facilities in the south side of Denali may be determined based on visitor trends in regard to overall vacation/pleasure travel to Alaska, Alaska Railroad passengers (on routes to and from Denali), cruise ship line passenger departures and arrivals, as well as other sources of travel demand.

Alaska Visitor Statistics

The Alaska visitor industry consists of several market segments. Broadly, visitors can be Alaska residents or nonresidents.

The tourism industry is the part of the visitor industry which serves pleasure-related visitors, which includes vacation/pleasure and visiting of relatives and friends components. Some visitors are, of course, those traveling on business or seasonal workers. Visitors from outside Alaska have increased substantially, especially in the later years of the 1980s and through the early 1990s. Nonresident Alaska visitation increased at about 10 percent per annum between 1992 and 1994. Because of a grounding as well as cancellations due to bad weather, cruise ship visitor arrivals posted a slight (-0.6 percent) decline in 1995, compared to 15.4 percent rise the previous year. Accordingly, the overall growth in arrivals between 1994 and 1995 was a modest 3.8 percent. The tourism industry in Alaska is highly seasonal, with over two-thirds of nonresident visitors arriving during the peak summer months of June-September. Nonresident visitors use the Alaska Marine Highway (Alaska State ferry) System, air carriers, cruise ships, and the highway system to enter and/or leave Alaska.

The most recent trends on Alaska (nonresident) visitor arrivals are contained in the McDowell Group report, *Alaska Visitor Arrivals: Summer 1995*, Alaska Visitor Statistics Program, State of Alaska Division of Tourism, Juneau, Alaska. These data are collected by sampling at portals in the field. Table K-1, which follows, contains numerical information on entry mode nonresident visitor arrivals for Summer 1995. The major travel modes are domestic air, cruise ship, and highway, which together accounted for 93 percent of such arrivals in Summer 1995. In 1995 the domestic air and highway segments grew at 4.2 percent and 13.4 percent, respectively, and cruise ship declined by -0.6 percent, over 1994.

Table K-2 presents data for nonresident Alaska visitor entry modes during the Summer for the years 1989, 1991, 1993, and 1995, based on the same source (op. cit., 1995). Overall growth for the six years presented amounted to 58.9 percent for an average annual rate of growth (AARG) of 8.0 percent, compared to 3.8 percent for the most recent year (1994 - 1995).

The average annual rates of growth by entry mode for 1989 - 1995 are in the final column. These ranged between 10.9 percent for cruise ship and minus 5.3 percent for international airline passenger arrivals. The cruise ship and domestic air travel modes are the two largest sources of visitors with a combined Summer 1995 share of 82 percent of the total. In Summer 1989 these sources represented about 76 percent of total visitors entering Alaska. It is worth noting that most cruise ship passengers enter the state using one of two modes of travel (cruise ship vessel or common air carrier) and depart via the other. This largely accounts for the rapid growth in visitor arrivals from both entry modes. The proportionate shares of visitor arrivals from the other entry modes — international air, Alaska Marine Highway system, and highway — have declined during the period.

Table K-1
Nonresident Alaska Visitor Entry Mode - Summer 1995

Mode	Visitor Arrivals	Percent Share	Percent Change from 1994
Domestic Air	508,300	52.5	4.2
International Air	13,300	1.4	-6.3
Cruise Ship	283,500	29.3	-0.6
Highway	108,100	11.2	13.4
Ferry	27,000	2.8	-4.9
Other*	26,900	2.8	31.9
Total	967,100	100.0	3.8

* Includes domestic air arrivals and private vessel and aircraft arrivals at select locations.

Source: McDowell Group, Alaska Visitor Arrivals, Summer 1995 (May to September).

Table K-2
Nonresident Alaska Visitors Entry Mode
Summer 1989, 1991, 1993, and 1995 *

Entry Mode	Arrivals Summer 1989	Arrivals Summer 1991	Arrivals Summer 1993	Arrivals Summer 1995	Percent Change 1989-95	AARG** 1989-95
Domestic Air	312,700	386,300	443,600	508,300	62.6%	8.4%
International Air	18,400	18,800	14,500	13,300	-27.7%	-5.3%
Cruise Ship	152,200	194,000	247,000	283,500	86.3%	10.9%
Marine Highway	27,000	29,600	29,100	27,000	0.0%	0.0%
Highway Alcan/Poker Creek:						
Pers. Veh.	48,700	49,600	55,300	66,500	36.6%	5.3%
Motor Coach	3,700	4,200	3,500	3,200	-13.5%	-2.4%
Skagway: Pers. Veh. & Motor Coach	30,200	29,300	33,100	38,400	27.2%	4.1%
Other***	15,800	14,700	20,100	26,900	70.3%	9.3%
Total Visitors	608,700	726,500	846,200	967,100	58.9%	8.0%

* May to September.

** Average Annual Rate of Growth (compounded).

*** Includes other domestic air arrivals, private vessel and private air arrivals.

Source: McDowell Group, Alaska Visitor Arrivals: Summer 1994 (June to September).

During the Summer 1995 (June to September), 72 percent of visitors were vacation/pleasure visitors, making this the dominant trip purpose group at 609,800 visitors. Since 1989, the number of vacation/pleasure visitors has increased 65.8 percent. Between Summer 1994 and Summer 1995, the number of vacation/pleasure visitors grew by 4.0 percent, compared to 3.6 percent for all nonresident visitor groups. According to the McDowell Group (*Ibid.*, 1995), the rapid increase in the number of vacation/pleasure visitors during the early 1990s is directly attributable to significant growth in the cruise ship market and strong growth in the independent traveler (i.e., travelers who do not purchase tour packages) market.

Visitors who visit friends and relatives were the second largest trip purpose group at 88,500 visitors, followed by business only at 81,300 visitors and business and pleasure at 54,900 visitors for Summer 1995. Seasonal workers comprised 12,000 visitors or only 1.4 percent of total nonresident visitors. The number of visitors visiting friends and relatives grew by only 2.1 percent since 1989. Business only visitors increased by 105.5 percent since 1989, (which apparently is an anomaly associated with using seasonal data), whereas the increase in business and pleasure visitors was modest at 11.4 percent. Finally, seasonal workers declined by 24.5 percent since 1989.

The Alaska Visitor Statistics Program (AVSP), from which the above and following information was obtained, divided Alaska into five regions: Southeast, Southcentral, Interior/Northern, Denali/Mt. McKinley, and Southwest. According to the McDowell Group, *Patterns, Opinions, and Planning, Summer 1993*, Southcentral and Southeast, with the most population and transportation facilities, attract most visitors. Sixty-eight percent of all nonresident visitors and 65 percent of vacation/pleasure visitors visited the Southcentral region in Summer 1993. The Southeastern region was visited by 60 percent of all visitors and 73 percent of vacation/pleasure visitors. The Interior/Northern region was visited by 35 percent of all visitors and 39 percent of vacation/pleasure visitors. Denali National Park and Preserve, was visited by about 36 percent of all visitors and 43 percent of vacation/pleasure visitors. The Southwest is the smallest attractor of the four regions with only 6 percent of all nonresident visitors. Visitation to Denali State Park increased from 399,607 in fiscal year 1990 to 474,699 in fiscal year 1995 for an average annual growth rate of 3.5 percent. Of the 1995 visitation, about 30 percent was

and 4 percent of vacation/pleasure visitors visiting that region in Summer 1993.

The travel patterns and characteristics of vacation/pleasure visitors to Denali/McKinley National Park are of particular interest to this study. Roughly equal shares of visitors entering Alaska came by domestic air and cruise ship — at 40 percent and 39 percent, respectively. Highway entry mode was next greatest at 15 percent, followed by ferry and international air at 4 percent and 1 percent, respectively. The distribution of visitors leaving Alaska by mode of travel was similar with 42 percent exiting using domestic air, 36 percent cruise ship, 15 percent highway, 5 percent ferry and 2 percent international air.

Most nonresident visitors to Denali/McKinley were either on package or inde-package tours. Those on package tour registered 46 percent of total vacation/pleasure visitors. Half as many (23 percent) were classified as inde-package. Independent visitors represented 31 percent of vacation/pleasure visitors to the area.

The average length of stay of vacation/pleasure visitors to Denali/McKinley amounted to 13.2 days in Alaska of which 1.9 days or 17 percent of the Alaska trip took place in the region. Most stayed at a resort/lodge at 45 percent or hotel/motel at 23 percent of total vacation/pleasure visitors to the region. The next largest overnight lodging category was RV/campground at 29 percent. Wilderness, B&Bs, private home, and other categories contributed small shares (4 percent and under) to the composition of overnight lodging within the region.

The average age of vacation/pleasure visitors to Denali/McKinley was 53 years. Forty-seven percent of the visitors were male and 53 percent female. Eighty-five percent of the visitors were from the U.S. with 4 percent of foreign visitors from Canada and 11 percent overseas.

Visitation to Denali State Park and Denali National Park and Preserve

comprised of non-Alaska residents. Peak month visitation occurred in July in almost all units in the park. The percent of total annual visits during the peak month ranged from 22.6 percent in the Denali

Viewpoint South unit to 50.0 percent at the Chulitna River bridge unit in 1995. The Alaska Veterans Memorial had peak visitation during the month of May (because of Memorial Day ceremonies). Normally, peak visitation at this site occurs in July. Visitation at Byer's lake amounted to 12,185 in 1995, of which 4,647 were non-Alaska residents.

The entrance to Denali National Park and Preserve is located on Alaska Highway 3 (The George Parks Highway) about 240 miles north of Anchorage and 120 miles south of Fairbanks. Visitation at Denali National Park and Preserve has grown dramatically since 1972 when the George Parks Highway was completed between Anchorage and Fairbanks and visitors could easily reach the park by private car instead of taking the railroad. The park currently has the largest visitation of any of the Alaska national parks. In 1995 Denali National Park and Preserve recreation visits totaled 544,209 according to NPS public use records. This figure represents a decline of about 8 percent from the peak figure of 592,431 registered in 1988, which ended a growth phase in visitation. Overnight stays were essentially unchanged between 1985 and 1995 with a downturn occurring in 1989 and modest growth after 1990. Increases occurred in all categories (concession lodging, campgrounds, backcountry, etc.), except the concession hotel which remained static at about 24,500 overnight visits.

Most visits to Denali National Park and Preserve occur during June, July, and August. Virtually all use is on the north side of the park along the 88.5-mile park road corridor between McKinley Park and Wonder Lake. Monthly recreation visits for the years 1992 through 1995. The peak month occurred in July for both 1992 and 1993, with approximately 34 percent of the annual total, whereas it was in August in 1994 and 1995, with 29 percent and 31 percent of total annual visitors, respectively. In fact there was little variation in the number of visitors during the summer months in 1995 in contrast to the three previous years. Park use figures do not distinguish between non-Alaska and Alaska residents.

In 1994 the 5,094 limit for tour and shuttle buses was adjusted to 2,089 tour buses and 3,394 Vehicle Transportation System (VTS) buses (op. cit., June 1996). Increased use of the park road has resulted in total traffic exceeding the seasonal limit of 10,512 vehicles by a small amount (40 vehicles in 1995). Only one of the tours, the long tour, called *Denali Tundra and Wildlife Tour*, is counted toward the GMP seasonal limit. The short tour or *Natural History Tour* is not counted. According to the NPS

The majority of visitors enter the area by way of the George Parks Highway and to a lesser extent the Alaska Railroad (AKRR), although the share represented by the latter has increased substantially during recent years. Total rail passenger arrivals increased from about 86,000 in 1989 to 133,000 in 1995 or 55 percent. Most rail passenger arrivals are associated with package tours (both Princess Tours and Westours accounted for 110, 500 arrivals in 1995). Recall from the discussion on park visitation that the number of visits to the park during this period remained constant. A small percentage of visitors travel by small aircraft to the McKinley Park airstrip inside the park or to private airstrips outside the park. Passenger arrivals to Denali National Park and Preserve by travel mode in 1995 are provided in Department of Interior, National Park Service, *Draft Entrance Area and Road Corridor Development Concept Plan/EIS, Denali National Park and Preserve* (June 1996). The arrival numbers for the railroad travel mode have been updated using AKRR data (obtained June 21, 1996). They are as follows:

Transportation Mode	Number of Visitors
Automobile	373,569
Railroad	132,968
Bus (estimated)	28,832
Air	5,053

The major often cited reason for the relatively slow growth, indeed in some years decline, in visitation to Denali National Park and Preserve is the seasonal limits placed on the number of vehicles that can travel on the park road beyond the paved road section. The *1986 General Management Plan* established the following traffic limits for the core visitor use period (May 26–September 13):

Tour and shuttle bus	5,094
Private vehicles	3,664
NPS vehicles	1,754

Compliance Officer at Denali National Park and Preserve (Steve Carwile) , total 1995 passengers carried on the VTS and long tour amounted to 87,722 persons and 109,448 persons, respectively. The allocation seasonal total (i.e., passengers carried between May 26 and September 13) were the same for the VTS and somewhat lower at 102,640 for the long tour. With a maximum of 2,089 trips per season and 52 persons per bus, total capacity for the long tour amounts to 108,628 from May 26 through

September 13. Clearly the long tours is effectively operating at capacity. Short tour passenger counts amounted to 48,270 passengers overall and 44,025 during the allocation season. The figures for the VTS were down slightly (about 1,800 fewer passengers) from the previous year. The long- and short tour totals were higher by about 3,000 passengers each, compared to 1994. Part of the reason for the decline in VTS passenger counts between 1994 and 1995 may be that the VTS was converted to a concession operation with buses that carry 3.5 fewer passengers on average. The VTS operates under a fixed schedule determined by NPS with a maximum seasonal capacity of 3,394 bus trips. With an average of 30 passengers per bus, the VTS estimated capacity is approximately 101,820 passengers. Thus, in 1995 capacity utilization for the VTS was about 86 percent.

The seasonal limit on private vehicles includes commercial and personal vehicles traveling to Kantishna. Professional photographers allowed to drive the park road beyond Salvage River are limited to 10 vehicle permits per day.

No limits have been established for road use during the shoulder season (May 15–25 and September 14 until road closure). During the period May 15–25, private vehicles and tour buses are permitted to drive as far as Teklanika rest stop, pending weather and road conditions. In September, after the VTS ceases operation, a lottery system limits the number of private vehicles allowed on the park road. During the second weekend after Labor Day (Friday–Monday), up to 1,600 lottery winners (400/day) are permitted to drive their vehicles as far as Kantishna. Actual use in 1995 exceeded 300 on only one of the four days, reaching 308 vehicles.

Although there is no restriction on vehicular use of the paved road, NPS traffic statistics indicate that use is increasing steadily from spring through fall with as many as 500 vehicles per day during the peak season. In an effort to determine the effect of the vehicle access limitations on visitor travel to the park, a study of so-called turnarounds was conducted in 1995. This was done by questioning vehicle drivers at the Salvage River check station (located at the end of the paved section of the park road). A total of 3,700 vehicles (and occupants) participated in the study. Only 5 percent of persons interviewed indicated that they were upset or disappointed because of the limitation on vehicular access beyond that point.

The Chief of Marketing at ARAMARK Leisure Services, the main concessioner at Denali National Park and Preserve, noted the possibility that the seasonal limits may have induced the development of other tourism-oriented activities in the immediate area. These include flightseeing, rafting, horseback riding, a driving range (and a possible future development of a golf course).

In summary, the data on VTS, long tour, and private vehicular use of the park road support the conclusion that visitor use of park facilities is at the maximum available given the constraints on vehicle access during the core season. This condition has persisted for several years. Anecdotal evidence suggests that Alaska residents and independent nonresident visitors have experienced the greatest impacts because of the limitations as they are less likely to make travel and lodging arrangements in advance, compared to package tour operations. Nonetheless, future growth in visitation by package tour and independent package visitors is also likely impeded due to the limitations on capacity.

Regional Visitor Projections

Recent (unpublished) projections of vacation/pleasure visitor growth were made available by the Kelsh Company, which is under contract to the Alaska Visitors Association (fax communication, June 5, 1996). The projections cover the period between 1995 and 2020. As noted above in the discussion on Alaska visitation, vacation/pleasure visitors contribute the bulk of growth to the tourism industry, increasing by 65.8 percent between 1989 and 1995. Visitors of friends and relatives, the next largest visitor group, grew by only 2.1 percent during the same period. Moreover, vacation travel is likely to increase, based on information provided by the Kelsh Company. Between 1993 and 2000 U.S. resident vacationers are expected to increase by 15 percent. Foreign vacationers are projected to increase by 17.2 percent.

By the Summer 1995 the number of vacation/pleasure visitors reached 609,800. Using linear regression techniques and historical annual visitation data for the period 1985 - 1995, the Kelsh Company projects this component of visitor travel to reach 1 million visitors by 2006 and close to 1.3 million by 2020. This would represent a doubling of current vacation/pleasure visitation levels.

Information is also provided on the cruise ship industry which contributes substantial tourism activity to Alaska. Cruise ship capacity has increased rapidly over the past decade and a half. The average annual rate of growth (AARG) in capacity for the North American market has been 7.6 percent since 1981. Passengers carried has grown by an AARG of 8.3 percent during the same period, based on information provided by the Kelsh Company. These figures are consistent with information on revenue passenger figures provided the Manager of Customer Service, Port Corporation of Vancouver for cruise ships operating between Vancouver and Alaska ports. During recent years growth in passengers has averaged 10 percent. It is anticipated that annual growth during the next two years will increase between 7 and 12 percent, given programmed increases in ship capacity.

According to the information provided by the Kelsh Company, growth in cruise ship capacity (contracted and planned berths through 1999) is projected at 7 percent per annum. Currently, there are 21 ships under contract through 1999 with an average of 1,683 berths per ship. For example, Princess Cruises plans to add a 1,950 berth ship in 1997 and a 2,600 berth ship in 1998. Holland-America plans to add a 1,266 berth ship in 1996 and a 1,318 berth ship in 1997. Both lines operate 6 ships in the Alaska market currently. Nonetheless, it is likely that some ships will be replaced by these new ships.

The Kelsh Company also projected the number of visitors to Denali/McKinley based on trend analysis using Alaska Visitor Statistics Program numbers for 1985, 1989, and 1990 as well as package tour visitors on Princess Tours and Holland-America operated tours. The projected visitors for Denali/McKinley increase from actual counts of about 300,000 in 1990 to 450,000 by 2005 and just under 700,000 by 2020. Princess Tours and Holland-America are projected to sell 146,000 package tour visits to Denali/McKinley in 1997 increasing to 205,000 in year 2001.

The above projections constitute the available information on projections of tourism activity in Alaska. While they reflect historical conditions and, thus, may be considered a reasonable basis for planning, particularly in the near term, reliability of the projections is likely to diminish the farther out into the future they are performed. It is well-known from statistical studies of human behavior that high growth rates in observed behavior are difficult to sustain over longer periods. Therefore, given the

recent history of rapid tourism growth in Alaska, it is likely that future activity will be less than the levels projected using the linear regression techniques, as discussed above.

SOUTH SIDE VISITOR PROJECTIONS

Proposed Action

Overview. The rationale for visitor projections developed for the proposed action is basically three-fold.

First, as noted in the affected environment section dealing with visitor use, existing Denali National Park and Preserve facilities are at or near peak use given the constraints on vehicle access during the core season. This condition has persisted for several years and is expected to continue. Anecdotal evidence suggests that Alaska residents and independent nonresident visitors are less likely to make travel and lodging arrangements in advance, compared to package tour operations and, thus, may feel frustrated by the limitations placed on park road use.

Second, future growth in visitation, particularly of non-Alaska residents (mostly package tour and independent package visitors) is likely to be impeded due to the limitations on capacity. Overall, nonresident visitation grew by about 59 percent between 1989–1995 or 8.0 percent on an average annual basis. Visitor arrivals by cruise ship and domestic airlines (primarily with package tours) have been the largest contributors to the high historical growth in visitation. This pattern is expected to continue. Cruise ship capacity (planned and contracted berths) is projected to increase at 7 percent per annum through the end of the decade. According to a respected industry source (Kelsh Company) Princess Tours and Holland-America are projected to sell about 146,000 package tour visits to Denali/McKinley in 1997 increasing to 205,000 in year 2001. The same source projects total visitation the Denali/McKinley area of 450,000 in 2005 increasing to 700,000 by 2020, based on current trends. Even if the visitation levels projected are not sustained due to capacity problems or shifts in market demand, it is highly likely that future visitation will exceed current levels by a wide margin.

Finally, the Tokositna site is expected to draw many destination visitors to the south side area. This is because visitor experience would be comparable to that provided at the interior of the north side of Denali National Park and Preserve. The site itself presents the visitor with the sense of the remoteness, power, and majesty of the Alaska Range and an unparalleled view of Mt. McKinley. Given the proximity of the site to Denali National Park and Preserve, most visitors would be able to actually “touch” the park. Thus, a Tokositna visitor center would represent a major destination or drawing card for visitors traveling either on package tours or independently. In addition, the trip to the site on Petersville Road would add to the experience of travel through the backcountry with magnificent views of lakes, streams, tundra, mountains, and possibly wildlife. And once at the Tokositna site, the visitor would have the opportunity to experience the backcountry on foot. A trail system would be available providing relatively short nature walks as well as extended hikes to Denali National Park and Preserve.

In summary, a Tokositna visitor center has the capability to attract visitors to the region as a primary destination. It could replace the north side as the major destination for many visitors seeking to experience the Alaska Range and Denali National Park and Preserve. A visitor center located along Parks Highway would likely not serve in this capacity. While such a visitor center is capable of attracting similar categories of visitors (i.e., package tour, inde-package, independents, etc.) and in large magnitudes, it would not replace the attraction of the north side of Denali National Park and Preserve as would be the case for the Tokositna visitor center under the proposed action. Similarly, the small (up to 3,000 square feet) visitor center to be located along the Parks Highway inside Denali State Park under the proposed action would not attract many new or incremental visitors to the area. It would serve primarily as a rest-stop and contact center for visitors traveling on to the north side or alternatively to the Tokositna visitor center. Because most visitors using the small visitor center would be expected to continue up the Parks Highway to the north side or travel on the Petersville Road to the Tokositna site, they would be considered to be either part of the visitor baseline or part of the increment projected for the Tokositna visitor center. Thus, a separate projection of visitation to the small visitor center was not prepared.

Transportation Infrastructure and Existing Use.

Highway traffic through the south side is moderate and free-flowing. Recent Alaska Department of Transportation and Public Facilities data on average daily traffic (ADT) in both directions was obtained for the George Parks Highway near Byers Lake and at crossings and intersections near the Petersville Road and Talkeetna. At Byers Lake, ADT on the George Parks Highway was 1,200 in 1995, 980 in 1993, and 821 in 1990. In 1995, the ADT on the highway at Trapper Creek, near the junction with the Petersville Road, was 1,285 vehicles per day, an increase from 1,000 in 1993, and from 1,020 in 1990. Traffic on the Petersville Road in 1995 was 200 vehicles per day at the junction with George Parks Highway and 110 vehicles per day at a point on the paved section of the road 2 to 3 miles from the junction with the highway. Most vehicles enter the Petersville Road for relatively short trips. ADT counts are calculated over an entire year; if traffic flows were considered during the summer season only, the ADT during these months could be twice as high. That is, most vehicles entering Petersville Road are relatively short trips. (ADT in 1990 was 190, whereas in 1992 it was recorded at 170 vehicles.)

Recreational use has been studied by Alaska State Department of Natural Resources, *Susitna Basin Recreation Rivers Management Plan: Resource Assessment, August 1991*. Dreshka River management includes, as northerly sources, Moose Creek and Kroto Creek. Moose Creek is about 8 miles out on Petersville Road, while Kroto Creek is near the Peters Creek crossing, about 13 miles out. Other access to Dreshka River and tributaries is by air (floatplane) and boat; however, neither Kroto Creek nor Moose Creek should be considered a navigable stream. Kroto Creek is described as a shallow, boulder-strewn stream. Moose Creek is described as a small stream about 30 to 50 feet wide that flows through spruce/birch forests. Jetboats, airboats, and propeller-driven craft are used on the Dreshka River mostly for fishing, but also for hunting moose and bear. However, Moose Creek has little powerboat use, but is used by floaters. With half the flow of Moose Creek, Kroto Creek has no powerboat use. There are several float trip possibilities on Moose Creek and Kroto Creek. The Dreshka is a popular Alaska site for float trips. Angler effort is also substantial on the Dreshka, with king salmon and rainbow trout the most frequently caught species.

Recreation river use in the Susitna Basin makes up a relatively small proportion of total statewide river use and is considerably less than for the Kenai River system. Visitor use on the Dreshka River system,

including Moose Creek and Kroto Creek, has been estimated for 1989 in the State of Alaska Department of Natural Resources study (*ibid.*, August 1991). The data are available over the year so that usage peaks can be identified. Major points include:

- Peaks included the king salmon run peak in mid-June and the silver salmon run peak in mid-August. Average uses were 935 person-days and 409 person-days, respectively.

Comparing private and commercial use and access, about 15 percent of private users were transported by air taxi and 85 percent furnished their own transportation for access. About 11 percent of use is commercial, including use of lodges, cabins, and guides. It is assumed that providers of these facilities and services include access services.

There is no comparable information on other recreational and nonrecreational uses in the upper portions of the Petersville Road. Interviews with various residents and officials responsible for facilities in the area have suggested that considerable hunting occurs in the area during early fall months. Similarly, snowmachine use and cross country skiing are popular recreational activities during the winter. As noted above, as many as 75 vehicles are parked at Kroto Creek on weekend days by persons who engage in these activities.

From the foregoing it is possible to estimate (although crudely) the amount of baseline recreation-related visitation in the Petersville Road area. It is assumed that most of the visitors are Alaska residents; hence, projections of Alaska resident visitors to the proposed Tokositna visitor center would include visitation from the baseline components discussed here. Data on river use (Dreshka River System) suggests a total of about 12,600 person visits of which 10,700 are by individuals arriving by road (as opposed to air taxi) in their own vehicles. Another major visitor group consists of snowmachine and cross-country skiing recreationists. Based on a 40 weekend day winter season and a maximum of 150 persons per (weekend) The large vessel cruise ship trade is oriented to Seward as a destination (or origin). Princess Tours, Holland-America and others market cruise ship-air travel packages to the public which involve a charter bus trip or an AKRR connection between Seward and Anchorage. If a close-in destination visitor center of the quality proposed for Tokositna were available, Princess Tours, which is developing a hotel at milepost 133 on the Parks Highway, near the southern boundary of Denali State Park (but within

- Estimated total use for 1989 was 37,778 person-days.
 - The average trip length was 3 days; therefore, 12,593 person-visits were estimated.
- day (with a one-day stay), this group contributes about 6,000 person visits. Hunting and sightseeing would be expected to contribute at least 25 percent of total recreation-related visitation to the area or 5,600 person visits. Thus, total person visits associated with recreational activities under baseline conditions (1990) would amount to 22,300. By 1994 the baseline figure would have risen to about 27,100 person-visits, based on an AARG of 5.0 percent.

The above figure compares to 40,000 person visits in 1990 for Talkeetna, based on a similar analysis for a proposed Talkeetna visitor center conducted in 1992. The report titled "Talkeetna Visitor Center Impact Assessment," prepared by Transport/Pacific Associates, et. al., for the National Park Service and Matanuska-Susitna Borough, April 1992, provides projections of baseline and incremental (to the then proposed Talkeetna NPS visitor center) visitation between 1994 and 2003. The 1994 baseline projection is for 49,000 visitors. Interviews with local residents and community representatives in Talkeetna suggested that tourism-related visitation has been growing fairly rapidly during recent years, by as much as 10 percent per annum; although one business source indicated that visitation is down slightly in 1995. According to the Department of Transportation and Public Facilities airport manager at Talkeetna (Joe Powers), flight operations (most related to Denali NP&P flightseeing) have been growing at about 10 percent per year.

Mountaineering-related visits to Talkeetna have been increasing steadily during recent years. Attempts to scale Mount McKinley, South Peak have risen from 645 in 1985 to 1,277 in 1994, doubling over the period. Total attempts through August 10, 1995 were 1,220. Added to this figure were about 125 attempted climbs on other peaks.

the park), might be interested in moving passengers with such package arrangements directly to this hotel, which is quite close to the proposed Tokositna visitor center site. Currently, such passengers are bused to Anchorage and either fly home or, after spending a night in a hotel in Anchorage, travel to North Side Denali in cruise ship line-owned rail cars. Some of the latter passengers spend one or more nights at the Princess Hotel, near the entrance to the North Side Denali park road. There is an obvious

financial advantage to Princess to instead include a South Side Denali stop-over with a night or two in the nearby (milepost 133 on the Parks Highway) Princess Hotel. In fact it may become advantageous for Princess Tours to provide train service to its passengers visiting South Side Denali from Seward, thereby bypassing Anchorage and avoiding the cost of providing overnight accommodations in that city. For this to happen, according to information provided by Princess Tours (Tom Dow, telecon 9/1/95), rail service from Seward would have to be increased from one train per day. Other transportation improvements, such as providing road access to Whittier, would also enhance access to the Denali South Side area and improve package tour operations involving cruise ships. Holland-America West Tours, which also provides rail and bus service to its passengers from Anchorage to North Side Denali, could be expected to replicate the strategy used by Princess Tours.

The Alaska Railroad (AKRR) currently provides service to Denali National Park and Preserve from Anchorage and Seward. Some of this service is from cruise ship package tour and independent passengers. Currently, there is a station at Wasilla and another at Talkeetna as well as at North Side Denali. Schedules are quite tight in order to meet the demands of 12 hours of travel time each direction between Anchorage and Fairbanks in order to provide daily service on the route. If Holland-America West Tours built a hotel at Montana Creek (south of Talkeetna Junction), for example, a station might be developed there or somewhere else on the rail line near George Parks Highway to service Tokositna and the two hotels, although this might require closing an existing station on the route. AKRR is already facing the new Princess Hotel traffic ingress/egress in the near term. AKRR intends to relocate the Talkeetna station from the town center to a site near Talkeetna Spur Road about three-quarters of a mile to the south. The new station is necessary in order to accommodate the Princess passenger cars required to handle passenger traffic between Anchorage (or possibly Seward) and the new hotel

Visitor Projections. As noted in the previous section, the most recent information on overall summer visits by non-Alaska residents is that developed by McDowell Group in 1995 under the AVSP program, which obtains visitor arrival counts every year at numerous Alaskan portals. Long-term trends (based on 1985 - 1995 data) for non-Alaska resident visitors to Alaska suggest a substantial growth, both overall and for cruise ships. The

average annual rate of growth for total visitors by all entry modes (846,500 in Summer 1995) was 5.5 percent. Comparable growth figures for cruise ship visitors and domestic airlines suggest average annual growth rates of 6.3 percent and 6.7 percent, respectively. It could be argued that continued high rates of growth will not persist into the future; nonetheless, the historical trends provide a reasonable basis for projecting visitation over the 15-year timeframe covered by the DCP.

As mentioned previously, the Tokositna site has the potential for attracting new visitors interested in experiencing Denali National Park and Preserve by a significant amount (although alternative A would likely attract many more baseline visitors because of its location on George Parks Highway). A destination visitor center would help to redistribute visitation and travel to South Side Denali National Park and Preserve. It would provide an option for users to gain access at a location possibly as desirable as the North Side Denali area, at least for some groups. The Tokositna site could provide access to mountain peak views and nature at a much closer site to Anchorage and Seward.

If a destination visitor center were developed at Tokositna, as envisioned for the proposed action, it could attract substantial visitation from tourists from both inside and outside Alaska in a way similar to Portage Glacier, which attracts approximately 400,000 visitors annually. Portage Glacier is located about 50 miles southeast of Anchorage near the highway to Seward and other Kenai Peninsula destinations. Portage Glacier is perhaps the most accessible glacier-viewing experience near Anchorage, with Exit Glacier at Kenai Fjords National Park, which is an additional 60–70 miles distance, receiving many visitor as well. Visitation at Portage Glacier was estimated to be 42 percent of the Summer 1993 AVSP Vacation/Pleasure visitors from outside Alaska. However, the distance from Anchorage to the Tokositna site would be about triple that from Anchorage to Portage Glacier. The 150 or so miles from Anchorage to Tokositna would effectively limit day use to those willing to spend a long day, since driving is relatively slow on 2-lane roads, even the best ones.

Table K-3 summarizes the visitor projections for the various groups in five year increments during the period 2002–2012. Projected visitation to the Tokositna visitor center amounts to 92,000 in 2002 for all groups. By 2007 the projected figure increases

to 169,000, further increasing to 207,000 in 201, the final year of the projection horizon.

TABLE K-3: VISITOR PROJECTIONS FOR TOKOSITNA VISITOR CENTER -- YEARS 2002, 2007, AND 2012

Visitor Groups	Year 2002	Year 2007	Year 2012
Baseline Visitors	14,500	18,500	23,500
Incremental Visitors *	77,500	150,500	183,000
Non-Alaska Residents			
Package - Overnight *	30,000	64,500	78,000
Package - Day	6,000	13,000	16,000
Inde-Package	15,000	32,000	39,000
Independent	10,000	21,000	26,000
Subtotal	61,000	130,500	159,000
Other Visitors			
Residents	10,000	11,000	13,000
Nonresidents Visiting Friends and Relatives	6,500	8,500	11,000
Subtotal	16,500	20,000	24,000
Grand Total	92,000	169,000	207,000

*Includes 19,000 visitors associated with the new south side Princess Tours hotel.

Table Notes:

Baseline visitors are assumed to increase at an AARG of 5 percent after year 2002.

Package-overnight visitors in 2002 include visitors at the new Princess Tours hotel (19,000 in 1998 expanded at an AARG of 6.3 percent for a total of 24,250 in 2002); visitors from other cruise ship tours (1,200 based on 5 percent of Princess Tour hotel visitors); and visitors using other entry modes (4,600 based on 18 percent of cruise ship tour package visitors). For 2007 package-overnight visitors in 2002 are expanded using an AARG of 6.3 percent plus an additional package tour hotel is added with 19,000 visitors. For 2012 package-overnight visitors in 2007 are expanded using an AARG of 4.0 percent.

Package-day use visitors in 2002 include visitors at the new Princess Tours hotel (5,000 in 1998 expanded at 5.5 percent for a total of 6,000). A second increment of 5,000 is assumed by 2007 based on an additional package tour hotel along with a growth rate of 5.5 percent applied to the first increment. Thereafter, a growth rate of 4.0 percent (AARG) is assumed.

Inde-Package visitors in 2002 are assumed to represent about 50 percent of overnight package tour visitors. They are assumed to increase at an AARG of 5.5 percent between 2002 and 2007 and 4.0 percent between 2007 and 2012.

Independent visitors are calculated based on 33 percent of overnight package tour visitors.

Alaska resident visitors are assumed to increase at an AARG of 2.5 percent after 2002.

Nonresidents visiting friends and relatives are assumed to represent 11 percent of other nonresident visitors with increases based on an AARG of 5.5 percent between 2002 and 2007 and 4.0 percent between 2007 and 2012.

Baseline Visitors — Baseline use would be relatively small particularly as many of the existing visitors to the area engage in specific activities, such as fishing and hunting, that are not oriented to tourism. Among 22,300 person-visits associated with recreational activities in 1990, perhaps 8,000 (roughly one-third of visitors) would represent baseline visitors to the Tokositna visitor center. By 2002 this group would be expected to increase to 14,500, based on a 5.0

percent AARG. The number of person-visits would increase to 18,500 in 2007 and 23,400 in 2012.

Incremental Use — Visitation of course would come from tourism groups representing both non-Alaska resident tourists, consisting of package tour and independent visitors as well as nonresidents visiting friends and relatives, and Alaska residents. Nonresident visitors are considered first. They are

considered to be traveling for vacation/recreation purposes only.

Package Overnight Visitors — Overnight visitors are expected to represent the lion's share of package tour visitors. One way to view visitor demand in regard to the group is to evaluate the increment of Denali National Park and Preserve visitors associated with the new Princess Tours hotel located at milepost 133 on George Parks Highway near Blair Lake and an additional hotel developed nearby (presumably in about 5 years after the Princess hotel begins operations), possibly by Holland-America Westours, both of which would be developed to handle increases in package tour visitors from cruise ship operations. The new hotels would serve package tour visitors who would be transported from Anchorage by rail and/or bus. The hotels and related tourism infrastructure would effectively establish a visitor market in the Denali south side area.

It is important to note that the figures reflect visitation by existing baseline and new or incremental visitors to the region. Visitors at the new Mount McKinley Princess Lodge are considered incremental for purposes of assessing impacts on the Petersville Road and at the Tokositna site. The new hotel also will be a major stimulus (along with NPS developments) to incremental visitation growth in the south side region. However, the estimated 19,000 person-visits associated with the new hotel are not considered to be incremental for purposes of assessing impacts on the regional economy, but instead are treated as part of the baseline. This estimate was based on hotel capacity of 320 beds, a 125-day season, 95 percent occupancy rate, and average stay of 2.0 nights.

The second package tour hotel would likely be developed after the turn of the century. For purposes of analysis, it is assumed that the hotel would accommodate an equal number of visitors with similar operating characteristics to the Princess Tours hotel.

If the 24,500 person-visits in 2002 associated with the new Princess Tours and other smaller (non-package tour) hotels that are likely to be developed during the initial period are expanded by 5 percent to reflect other cruise ship package tour visitors, i.e., those carried by other cruise ship lines, then the total *Inde-Package Visitors* — Independent visitors as a group would likely represent a lower fraction of total vacation/pleasure visitors than indicated for Denali/McKinley (54 percent of total vacation/pleasure visitors, based on AVSP Summer

number of potential person-visits from this group amounts to 25,700. This amount of visitation would represent a reasonable expectation of visitor use associated with the cruise ship package tour visitors. It is possible, however, that there would be a shift in the mix of such visitors from the Denali north side to the south side, as more facilities are provided to accommodate visitors in the latter area. However, the visitation increment stimulated above comprises the expected number of cruise ship package tour visitors who are likely to visit the Tokositna visitor center.

Package tour visitors using other entry modes (also overnights) are expected to represent about 18 percent of cruise ship package tour visitors, based on shares indicated for this group in the AVSP Summer 1993 data (46 percent of vacation/pleasure visitors were on a package tour and 39 percent arrived on cruise ships) or 4,600 visitors.

Summarizing the overnight package tour visitors: cruise ship and other users would contribute 30,050 person visits in 2002, growing to 64,050 by 2007 (an additional package tour hotel is assumed and an AARG of 6.3 percent AARG as derived from 1985 - 1994 AVSP data in regard to cruise ship passenger arrivals). The person-visits from this group increase to 78,200 in 2012 (based on a 4.0 percent AARG after 2007), the final year of the projection horizon.

Package Day Use Visitors — Most package tour visitors would be expected to stay overnight at hotel/lodging facilities in the Denali south side area. However, some would be day visitors. Following the analysis of the "Talkeetna Visitor Center Impact Assessment" (op. cit., April 1992), an arbitrary figure of 10,000 day-use visitors associated with package tours is applied (5,000 associated with the new Princess Tours hotel beginning 1998 and growing to 6,400, based on an AARG of 5.5 %, which is assumed through year 2007. By 2007 the second 5,000 visitor increment is expected in addition to growth in the first increment for a total of 13,100 visitors. Thereafter, the growth rate is assumed to decline to 4.0 % AARG. Person-visits for this group, thus, increase to approximately 15,900 by 2012.

1993 data). However, inde-package visitors, most purchasing tours in Anchorage, would probably choose a Tokositna tour at least in the same proportion as indicated for vacation/pleasure visitors traveling to Denali/McKinley. Indeed, there could be

reductions in such tours by inde-package visitors to the latter because of diversions to Tokositna due to shorter trip times and lower costs associated with the Tokositna tour. Assuming that similar ratios for package and inde-package visitors at Denali/McKinley apply to Tokositna (46 percent package and 23 percent inde-package), a figure representing about half of (overnight) package tour visitors would come to Tokositna visitor center as inde-package visitors or 15,025 in year 2002. Based on an AARG of 5.5 percent between 2002 and 2007 and 4.0 percent thereafter, they would increase to 32,150 in 2007 and 39,100 in 2012.

Independent Visitors — Independent visitors to Tokositna visitor center would be expected to have a lower visitation share than indicated for the Denali/McKinley (31 percent of total vacation/pleasure visitors and 67 percent of package tour visitors) due to differences in attractions, flexibility in scheduling, availability of campgrounds, and travel route preferences (many travel to and from Fairbanks and points north). Assuming visitation at half the share for Denali/McKinley in relation to package tour visitation (or 33 percent of package-overnight visitors), the number of person-visits for this group would amount to 9,900 in 2002. The number of visitors increases to 21,200 in 2007 and 25,800 in 2012 (which assumes the addition of a new package tour hotel and consequently rapid growth in visitation after 2002).

Incremental Alaska Resident Visitors — Residents from the south-central region of Alaska are likely to contribute a substantial share of visits to the Tokositna visitor center. The Talkeetna Visitor Center Impact Assessment (op. cit., April 1992) refers to an Anchorage Convention and Visitors Bureau 1990 survey from which it was determined that approximately 75,000 south-central residents traveled to the Denali National Park and Preserve and Denali State Park areas in 1989 for all recreational purposes. (It is assumed that the survey did not include travel in the Petersville Road area.) This represented about 24 percent of the region's population. In 1995 the comparable figure would be about 85,000 residents traveling to the Denali park areas, given population growth since 1989. Assuming that 10 percent of visitors from this group would include a visit to the Tokositna area, this would represent 8,500 person-visits. Clearly, this

Overview. The emphasis for alternative A is on providing visitor facilities and services within easy access from the George Parks Highway to visitor

assumption, which is the same as used in the Talkeetna Visitor Center Impact Assessment (op. cit., April 1992), results in a modest number of resident visitors. The south-central region's population growth rate was approximately 2.5 percent per annum (between 1990 and 1994). This rate of growth was applied to obtain visitation by this group in 2002 of 10,100. By 2007 the number of person-visits would increase to 11,400; the number would increase to 12,900 in 2012.

Non-Alaska residents visiting friends and relatives could be expected to add a substantial number of visits to the Tokositna visitor center. In 1994 this group contributed visitation of 11 percent above that for vacation/pleasure visitors. Assuming that this share applies to non-Alaska resident visitors who visit the Tokositna area, which were estimated at 61,000 in 2002 (as shown in table K-3 above), the number of visitors to the Tokositna visitor center from this group would amount to 6,400. Some would travel with the resident visitor group for which visitation figures were estimated previously. Others would travel alone. Based on an AARG of 5.5 percent, the nonresident group visiting friends and relatives would increase to 8,400 in 2007. Thereafter, the growth rate is assumed to decrease to 4.0 percent (AARG), with projected visitation at 11,000 in 2012.

Total other visitors, comprising Alaska residents and nonresident visitors visiting friends and relatives, thus, are estimated at 16,500 in 2002. The figures for 2007 and 2012 are 19,800 and 23,900 person-visits, respectively.

It is important to emphasize that the visitation figures projected for the outlying years 2007 and 2012 assume development of a new package tour hotel (in addition to the Mount McKinley Princess Hotel). If development of a new package tour hotel does not take place, then the visitor projections would be considerably lower. Using similar methods to those described above, the projection total for 2002 would be the same at 92,000 visitors; total visitors would amount to 121,000 and 147,500 for the years 2007 and 2012, respectively.

Alternative A

facilities. Alternative A is focused on development of a visitor center in Denali State Park in one of three state park development zones. The southern

development zone is located along the George Parks Highway within the first four miles of the Chulitna River bridge at the state park's boundary. The central development zone is located one mile south to one mile north of the existing Byers Lake campground. The northern development zone is located near the final three miles before the state park's northern border on the highway. A 50-site campground (or two smaller campgrounds totaling 50 sites), hiking/interpretative trails and roadside exhibits also would be developed.

This George Parks Highway visitor center would be developed within approximately 1 mile of the highway with a paved access road. Infrastructure development such as utilities would also be needed. The size of the visitor center would be up to 13,000 square feet. As such, it would provide a stopping place for visitors to north Denali National Park and Preserve as well as a destination for day use visitors from Anchorage.

Visitor Projections. The analysis of visitor projections is based on one prepared earlier for a previously considered Talkeetna visitor center. (See Transport/Pacific Associates et. al., *Talkeetna Visitor Center Impact Assessment*, Mat-Su Borough and NPS, Anchorage, April 1992.) Visitor projections also were based on several other data sources, including the AVSP II program, NPS visitor statistics and several other NPS and local government sources augmented by interviews with persons in the visitor industry, including local and regional experts and workers. This section describes the basis for the visitor projections for the previously considered Talkeetna visitor center and also explains why those projections are reasonable to use for alternative A. Visitor projections are shown in tables accompanying the text.

Key business decision makers were in agreement on a major issue -- that the then-proposed Talkeetna visitor center/hotel complex held relatively modest potential to generate new visitor industry development at Talkeetna. To estimate visitation, the pool of potential visitors to the visitor center was categorized into four groups: baseline visitors; new nonresident visitors to the Alaska railbelt, including package tour visitors traveling by rail or bus and independent visitors in private autos and light trucks; and other new visitors who might be called "induced" visitors who may be resident Alaskans or not. These are considered in turn.

Baseline visitors included current users of several types: river users; Denali National Park and Preserve south side visitors, including flightseers and mountaineers seeking access; and other recreation visitors. River users were those who visit to fish, hunt, and float on the Talkeetna River. This was considered to be a growth activity. In 1989, river users were estimated to number 7,915 between mid-May and the end of September. Fishing and boating on the Talkeetna River has become more popular in recent years. The fishing was expected by biologists to be able to handle a substantial increase in harvest pressure. Therefore, baseline growth in this component was expected to increase at a 10 percent annual rate through 1998 and 7.5 percent thereafter. Reference was made in the study to a 1990 NPS survey of Denali National Park and Preserve south side visitors through questioning 37 commercial services where recreation visitors gained access to the south side of Denali National Park and Preserve during 1990. Services were from Talkeetna or, in a few cases, nearby along the George Parks Highway. The firms served about 16,000 visitors, of which about 10,200 were flightseers and 1,000 were climbers. A 4 percent annual growth rate was expected, based on recent historical overall tourism growth in Alaska.

Other baseline visitors included casual sightseers, visitors to Miners Day, and visitors to the Moosedropping Festival and Winter Carnival. These visitors were not sport enthusiasts or flightseers, but those who were visiting for social and sightseeing reasons. Talkeetna appeared to have had 16,000 of these in 1990. Again, a growth rate of 4 percent was postulated. Table K-4 provides baseline visitor projections for the Talkeetna area.

The study estimated the number of visitors stopping at the then-proposed visitor center and how they would differ by the three use categories: one-fourth of river users, mostly south-central Alaska residents, were anticipated to stop, while 75 percent of Denali National Park and Preserve south side visitors and 50 percent of other (casual) visitors would likely stop. This reflects differences in interests as well as a larger south-central Alaska resident share for the other group. Estimates of the baseline visitors stopping at the visitor center in 1994, 1998, and 2003, as shown in table K-4, represented slightly over 50 percent of total visitors.

The report indicated that the Denali/McKinley region has relatively high concentrations of vacation/pleasure visitors, summer visitors, mid-

summer visits, and short visits. Also, a third of visitors traveled by private vehicle and stayed in RVs or campgrounds. Under the medium and expected projection scenario, the initial projection of overnighting package tour visitors is 28,000 visitors staying in a 150 room hotel/lodge open 4 summer months with room occupancy of 2 persons, 92 percent average room occupancy rate, and with all hotel guests stopping at the visitor center. In addition, owing to interviews suggesting private entrepreneurial caution, day use tourists by package tour visitors was estimated at 10,000 initially in 1994 and to grow at 4 percent thereafter.

TABLE K-4
BASELINE VISITATION TO TALKEETNA AREA
1990, 1994, 1998, AND 2003

User Category	1990 (h)	1994 (p)	1998 (p)	2003 (p)
Talkeetna River	8,000	11,700	17,100	24,600
Park South Side	16,000	18,700	21,900	26,600
Other	16,000	18,700	21,900	26,600
Total	40,000	49,100	60,900	77,800
Total Visitor Center	-	26,300	31,650	39,400

Key: h- historical; p- projected.

Source: Transport/Pacific Associates et al., *Talkeetna Visitor Center Impact Assessment*, Mat-Su Borough and NPS, Anchorage, April 1992.

Independent nonresident visitors were estimated as a share of all independent nonresident visitors traveling on the George Parks Highway between Anchorage and Denali National Park and Preserve. About 63,000 persons in this category traveled in 1990 by private vehicles and stayed overnight in RVs and campgrounds. Growth rates were again expected to be 4 percent. It was expected further that 12 percent of these would visit the visitor center, based on interviews with visitor industry professionals.

All other recreation visitors, including residents and visitors traveling in their company on a trip to Denali National Park and Preserve or Denali State Park, would be expected to stop. Based on unpublished figures obtained from the Anchorage Convention and Visitors Bureau and the AVSP database, a figure of 45,000 was used as an estimate of Alaska resident

visitors to Denali Parks. A 4 percent growth rate and a 7.5 percent capture rate were assumed, since these represented regionally-based travelers with local familiarity.

The final subgroup of other induced visitors included resident and nonresident relatives or friends traveling with residents for visits to regional promotional activities and to make use of nonpark visitor facilities and attractions. These could be also called regionally-based tourists. Some of these might be those discouraged from visiting the main Denali National Park and Preserve northern facilities due to crowding in mid-summer. These were anticipated to add 15,000 visitors. A growth rate of 4.0 percent (AARG) was again suggested. Table K-5 provides annual baseline and incremental visitors for the projection years.

TABLE K-5
BASELINE AND INCREMENTAL VISITATION TO THE PREVIOUSLY CONSIDERED TALKEETNA VISITOR CENTER
1994, 1998, AND 2003

Visitor Center Users	1994	1998	2003
Baseline Component	26,300	31,650	39,400
Incremental Visitors	66,100	72,600	91,700

Source: Transport/Pacific Associates et al., *Talkeetna Visitor Center Impact Assessment*, Mat-Su Borough and NPS, Anchorage, April 1992.

Visitor projections developed for the Talkeetna visitor center as earlier envisioned could apply to the visitor center proposed for alternative A. The basic visitor groups, likely growth rates, and basis for

estimation would not significantly change. However, the capture rates suggested for the earlier Talkeetna visitor center analysis may be too low, considering that the primary development would be near the

George Parks Highway in Denali State Park. This may be considered, but the initial suggestion is that alternative A is very similar to the previously proposed Talkeetna visitor center, and this leads to the conclusion that the visitor projections are perhaps as close as the information permits. Thus, the incremental visitor projections used here are the same as the chosen middle scenario for Talkeetna in

the study (shown in table K-5), with adjustments for the extended time horizon for the current study. They are as follows: 88,000 in year 2002; 99,500 in year 2007; and 114,000 in year 2012, the final year of the projection horizon, and are shown in Table K-6.

TABLE K-6
BASELINE AND INCREMENTAL VISITATION FOR ALTERNATIVE A
2002, 2007, AND 2012

Visitor Center Users	2002	2007	2012
Baseline Component	88,000	111,000	140,000
Incremental Visitors	88,000	99,500	114,000
Total Visitors	176,000	210,500	254,000

The incremental visitation at the visitor center includes package tour visitors from the new Princess Tours hotel; however, these visitors are considered to be part of the baseline for purposes of estimating impacts on the regional economy. While the visitor center under alternative A would provide orientation and information services to the region's visitors, it would not be a primary tourism destination. Moreover, it would not provide an alternative to the north side of Denali National Park and Preserve experience as well as would the Tokositna visitor center under the proposed action. For this reason, the visitor center under alternative A is not considered likely to generate market demand for a second package-tour hotel. Of course, this does not mean that one or more additional package tour hotels would not be built in the south side area. Rather, the reasons for developing an additional hotel(s) would not include visitor demand stimulated by the visitor center. More likely the reasons would relate to the need to accommodate visitors traveling on and to the north side of Denali National Park and Preserve and to Denali State Park.

Baseline projections for a visitor center located near the George Parks Highway would be substantially higher than indicated for Talkeetna (see table K-6). This is because of substantially higher traffic flows on that roadway. Nonetheless, as indicated in the discussion on the Affected Environment, visitation at the north side of Denali has reached a stable level due to restrictions on the number of vehicles allowed on the Denali National Park Road during the core summer season. Also, new south side facilities (such

as, the new Princess Tours hotel and the proposed visitor center) are expected to absorb some of the growth in visitation to the area. Thus, the rate of growth in baseline visitation to the Denali region would likely be reduced as new facilities in the south side are developed. Assuming that baseline growth would result in double the number of baseline visitors projected for incremental visitors through year 2002 and half that projected for the incremental visitors thereafter, total visitation at the visitor center along the George Parks Highway would amount to about 176,000 in year 2002; 210,500 in year 2007; and 254,000 in year 2012 (see table K-6).

These visitation projection figures are moderately higher than indicated for the Tokositna visitor center under the proposed action. As envisioned, the Tokositna visitor center would be a destination-type facility and would attract substantially greater numbers of new visitors than a visitor center located on or near the George Parks Highway. Total visitation, however, would be somewhat higher under alternative A because of the large number of baseline visitors traveling on the George Parks Highway who would be expected to use the new visitor center and associated facilities.

Alternative B

Overview. Alternative B is also mostly concerned with providing visitor facilities and services within easy access from the George Parks Highway. The primary focus of alternative B would be on the

development of a relatively small visitor center in one of three development zones within Denali State Park. **Visitor Projections.** The visitor center is not expected to result in significant increases in visitation, but would provide information and orientation to existing or baseline visitors en route to Denali National Park and Preserve or Denali State Park. Visitor projections were not made to evaluate impacts on the regional economy and for facility space planning.

Alternative C

Overview. Alternative C is the no-action alternative, which reflects a continuation of present recreation and visitor developments over the same time frame as the action alternatives. Visitor development that would be undertaken include construction of a 320-square-foot visitor contact facility adjacent to the Alaska Veterans Memorial in Denali State Park; development of four new public use cabins on the east side of the Chulitna River in Denali State Park; and conversion of an existing privately built cabin near Chelatna Lake to public use; development of a snowmachine users parking lot on Matanuska-Susitna Borough land near the Forks Roadhouse on the Petersville Road; and a variety of land use and natural resource management planning activities. In general, visitor travel and lodging demand considerations under the no-action alternative have been reflected above in the discussion on south side visitor demand as well as in the analyses of baseline visitor demand contained in the visitor projections for the proposed action and alternative A.

Visitor Projections. Alternative C visitation would be focused on the north side of Denali National Park and Preserve, as at present. Visitation for the north side has been relatively stable over the past 10 years or so due to current park road vehicle caps.

There are numerous strong sources of growth in tourism in Alaska generally from both Alaska residents and nonresident vacation/pleasure visitors. However, this has been true for at least the past five years and certainly to some extent even longer, and such growth has not resulted in corresponding growth in Denali National Park and Preserve visitation.

Recent Alaska Department of Transportation and Public Facilities data on average daily traffic (ADT) in both directions was obtained for the George Parks Highway near Byers Lake and at crossings and

Park.

intersections near the Petersville Road and Talkeetna. The traffic counts reflect moderately high, free-flowing traffic conditions. At Byers Lake, for instance, the ADT on the Parks Highway was 1,200 in 1995, 980 in 1993, and 821 in 1990. In 1995, the ADT on the highway at Trapper Creek, near the junction with the Petersville Road, was 1,285 vehicles per day, increasing from 1,000 in 1993; and from 1,020 in 1990. Traffic on the Petersville Road in 1995 was given at 200 vehicles per day at the junction with George Parks Highway and 110 vehicles per day at a point on the paved section of the road approximately 2–3 miles from the junction with the George Parks Highway, which contains most of the traffic. Most vehicles entering the Petersville Road are relatively short trips.

Recreational use has been studied by the Alaska State Department of Natural Resources, *Susitna Basin Recreation Rivers Management Plan: Resource Assessment*, August 1991. Deshka River management includes, as northerly sources, Moose Creek and Kroto Creek. Moose Creek is about 8 miles out on the Petersville Road, while Kroto Creek is near the Peters Creek crossing, about 13 miles out. Other access to the Deshka River and most tributaries is by air (floatplane) and boat.

Recreation river use in the Susitna Basin makes up a relatively small proportion of total statewide river use and is considerably less than for the Kenai River system. Visitor use on the Deshka River system has been estimated for 1989 in the State of Alaska Department of Natural Resources study (Ibid, August 1991). The data are available over the year so that usage peaks can be identified. Major points include:

- Estimated total use for 1989 was 37,778 person-days.
- The average trip length was 3 days; therefore 12,593 person-visits were estimated.
- Peaks included the king salmon run peak in mid-June and the silver salmon run peak in mid-August. Average uses were 935 person-days and 409 person-days, respectively.

Comparing private and commercial use and access, about 15% of private users were transported by air taxi and 85% furnished their own transportation for access. About 11% of use is commercial, including use of lodges, cabins, and guides. It is assumed that

providers of these facilities and services include access services.

There is no comparable information on other recreational and nonrecreational uses in the upper portions of the Petersville Road. Interviews with various residents and officials responsible for facilities in the area have suggested that considerable hunting occurs in the area during early fall months. Similarly, snowmachine use and cross country skiing are popular recreational activities during the winter that are experiencing rapid growth.

From the foregoing it is possible to estimate (although crudely) the amount of baseline recreation-related visitation in the Petersville Road area. It is assumed that most of the visitors are Alaska residents; hence, projections of Alaska resident visitors to the proposed Tokositna visitor center would include visitation from the baseline components discussed here. Data on river use (Deshka River system) suggests a total of about 12,600 person-visits of which 10,700 are by individuals arriving by road (as opposed to air taxi) in their own vehicles. Another major visitor group consists of snowmachine and cross-country skiing recreationists. Based on a 40 weekend day winter season and a maximum of 150 persons per (weekend) day (with a one-day stay), this group contributes about 6,000 person-visits. Hunting and sightseeing would be expected to contribute at least 25% of total recreation-related visitation to the area or 5,600 person-visits. Thus, total person-visits associated with recreational activities under baseline conditions (1990) would amount to 22,300. By 1994 the baseline figure would have risen to about 27,100 person-visits, based on an annual average rate of growth (AARG) of 5.0%.

The above figure compares to 40,000 person-visits in 1990 for Talkeetna, based on a similar analysis for a proposed Talkeetna visitor center conducted in 1992. The report entitled "Talkeetna Visitor Center Impact Assessment," prepared by Transport/Pacific Associates, et. al., for the National Park Service and Matanuska-Susitna Borough, April 1992, provides projections of baseline and incremental (to the then proposed Talkeetna NPS visitor center) visitation between 1994 and 2003. The 1994 baseline projection is for 49,000 visitors. Interviews with local residents and community representatives in Talkeetna suggested that tourism-related visitation has been growing fairly rapidly during recent years, by as much as 10% per annum; although one business source indicated that visitation was down slightly in 1995. According to the State of Alaska Department of Transportation and Public Facilities airport manager at Talkeetna, flight operations (most related to Denali National Park and Preserve flight-seeing) have been growing at about 10% per year. Mountaineering-related visits to Talkeetna have been increasing steadily during recent years. Attempts to scale Mount McKinley, South Peak have risen from 645 in 1985 to 1,277 in 1994, doubling over the period. Total attempts through August 10, 1995 were 1,220. Added to this figure were about 125 attempted climbs on other peaks.

APPENDIX L: REGIONAL ECONOMIC IMPACT ANALYSIS DETAIL

Prepared by Reed Hansen, Reed Hansen and Associates

Information is provided in this appendix on the regional economic changes associated with the planning alternatives being considered for the south side of Denali National Park and Preserve. Regional economic impact analysis was undertaken by evaluating the net construction costs and personnel requirements for new facilities as well as the spending patterns of visitors associated with the various alternatives. The National Park Service and state of Alaska construction and operations outlays and tourism-related visitor expenditures were allocated among industrial sectors pertaining to the input-output accounting framework of IMPLAN (1991-F Version), an economic impact model developed by the U.S. Forest Service. Input-output multipliers from IMPLAN can be used to estimate the impact of direct expenditures on additional indirect activity due to spending on intermediate goods and services, as well as induced activity due to respending of earnings by direct recipients (businesses and households) engaged in the visitor/tourism industry. Regional economic impacts are, thus, estimated in terms of total employment, earnings, and outputs, all in 1991 dollars.

The study area for the IMPLAN model consists of Matanuska-Susitna, Denali, and Anchorage Boroughs for the analysis of construction activity, whereas it includes only Matanuska-Susitna and Denali Boroughs for the analysis of visitor expenditures. Details of the regional economic analysis of construction and visitor spending impacts for the proposed action are presented in tables 1 through 8. Similar information is presented for alternative A in tables 9 through 14. The regional analysis for alternative B construction activities is presented in tables 15 and 16. There is no visitor spending analysis for alternative B as the small visitor center envisioned under this alternative is not likely to generate incremental visitation to the region.

PROPOSED ACTION

Facility Construction

Tables 1 through 3 covering facility construction reflect construction design and cost estimates developed for the proposed action based on information provided in "Appendix E: Development

Cost Estimates." Net construction cost estimates were used in analyzing the regional economic impacts for the proposed action and other alternatives under consideration. Most of the facility costs were developed by NPS personnel. The Petersville Road upgrading cost estimates were provided by the Alaska Department of Transportation and Public Facilities.

Table 1 in this appendix provides estimates of NPS (and state of Alaska) purchases for five major expenditure items: road improvements, building construction, landscaping/trail development, site utilities, and furnishing and equipment for interpretative media. Note that these figures are net construction costs, which are somewhat lower than the gross construction cost figures reported in the text and in appendix E, because construction supervision and contingencies have been removed for this analysis. Net construction costs total \$39.9 million (in 1995 dollars) for the proposed action. The Petersville Road construction (\$33.1 million) is the dominant component of total estimated outlays. These expenditure items were then aggregated into three construction-related industry sectors, new highways and streets, new industrial and commercial buildings, and new utility structures, as shown in the upper portion of the table. (New industrial and commercial buildings includes building construction, landscaping/trail development, and furnishings and equipment.) Total NPS and state of Alaska purchases of \$35.6 million are associated with direct employment and earnings of 277 full-time equivalent (FTE) workers and \$10.4 million, respectively.

Table 2 provides IMPLAN multipliers for the designated industry sectors. These are used to translate changes in direct employment, earnings, and outlays into estimates of total employment, earnings, and output.

Table 3 presents estimates of total employment, earnings, and output for facility construction for alternatives 1 and 2. Total FTE employment was estimated at 472 workers with associated earnings and output estimated at \$14.8 million and \$49.4 million, respectively.

Facility Operations and Visitor Expenditures

Total and incremental visitors and related expenditures are shown for the proposed action in table 4. The year 2002 is assumed to be the initial year of operations. For that year projected visitation to the south side area was estimated to total 92,175 visitors with the majority (58,675) characterized as incremental visitors. Visitors to the new Princess Mt. McKinley Hotel, which are estimated to total 19,000 per annum, are treated as part of the baseline for purposes of assessing regional impacts. However, they are included in the incremental total for purposes of estimating visitor flows to the proposed Tokositna visitor center. As shown in the table, the incremental total was allocated by visitor type (both Alaska and non-Alaska residents) and travel mode.

Visitation activity was also allocated over various support activities in the remainder of table 4. This activity is considered to be incremental, that is, it represents "new money" or spending within the region stimulated by the plan. After accounting for all visitor expenditures, using industry use factors and average expenditures per visitor, total expenditures in 1991 dollars were estimated at \$4.1 million, allocated 73 % to overnight visitors and 17% to day-use visitors.

Table 5 attributes the south side Denali visitor expenditures of about \$4.1 million and NPS purchases of \$0.4 million associated with the employment of 9 FTE positions across industry sectors. The highest shares of visitor purchases are shown to be in eating and drinking places and hotels and other lodging places, followed by general merchandise stores, amusement and recreation, and local passenger transportation. Lower expenditures are suggested for auto repairs and services and air transportation. Table 5 follows IMPLAN with respect to industry sector designations.

Table 6 provides estimates of direct employment and earnings by sector across the same industry sectors discussed above in relation to table 5. Total direct employment of 111.6 FTE workers is associated with \$1.6 million in direct earnings for the Proposed Alternative. Table 6 also provides the ratio of direct worker earnings to direct output for each sector represented as well as the average annual earnings (in 1991 dollars) for workers in the sectors presented. These factors were obtained from IMPLAN estimates of direct effects.

Employment, earnings, and output multipliers which indicate the relationship between direct to total figures for these three economic variables are presented in table 7. The multipliers have been used to generate estimates of total employment, earnings, and output for the impact region in year 2002, as shown in table 8. Total employment of 161.4 FTE workers is associated with total earnings of \$2.4 million and total output of \$6.7 million. Table 8 completes the analysis for the proposed action.

ALTERNATIVE A

Facility Construction

Construction outlays associated with alternative A were estimated at \$5.5 million in 1995 dollars, as shown in table 9. Only minor road improvements are required which is the main reason why total outlays are much lower for this alternative compared to the proposed action. Both alternatives envision development of a major destination visitor center. After deflating to 1991 dollars these outlays were estimated to result in final demand increases of \$4.9 million in the study region. The corresponding direct employment and earnings changes were estimated at 42.8 FTE workers and \$1.6 million, respectively. Table 10 presents estimates of total employment, earnings, and output, after applying the IMPLAN multipliers for the relevant industry sectors, as indicated in Table 2 above. Total employment was estimated to increase to 120.7 FTE workers with associated earnings of \$2.9 million resulting in increased output within the study region of \$7.2 million, as measured in 1991 dollars.

Facility Operations and Visitor Expenditures

Table 11 corresponds to table 4, only table 9 provides data on recreation visitors and related expenditures for alternatives A, also in year 2002, the presumed initial year of full operations. Total incremental visitors in this case were estimated at 69,000. Again, visitors to the Princess Mount McKinley Hotel are treated as part of the baseline for purposes of assessing regional impacts associated with alternative A. Incremental visitor expenditures were estimated at \$4.3 million, apportioned 67% to overnight visitors and 33% to day visitors.

Direct expenditures by the NPS and visitor expenditures of about \$4.6 million were apportioned across the IMPLAN industry sectors. NPS employment requirements were estimated at 6 FTE workers with associated earnings of about \$0.2 million.

Estimates of direct employment and earnings are provided in table 13. Total direct employment related to the south side Denali visitor center was estimated at 115.3 FTE workers with associated direct earnings of \$1.6 million.

Total estimated employment, earnings, and output for this alternative are provided in table 14. IMPLAN multipliers for the relevant industry sectors from Table 7 were applied to estimate total employment of 167.1 FTE workers with associated earnings of \$2.5 million and total output of \$7.0 million, as measured in 1991 dollars.

ALTERNATIVE B

Under this alternative a small contact visitor center would be constructed along the George Parks Highway in either the southern, central, or northern development

zone of Denali State Park. It is not expected to generate visitation increases above baseline levels.

Facility Construction

Construction outlays associated with alternative B were estimated at \$1.5 million in 1995 dollars, as shown in table 15. After deflating to 1991 dollars these outlays were estimated to result in final demand increases of \$1.3 million in the study region. The corresponding direct employment and earnings changes were estimated at 10.9 FTE workers and \$0.4 million, respectively. Table 16 presents estimates of total employment, earnings, and output, after applying the IMPLAN multipliers for the relevant industry sectors, as indicated in table 2 above. Total employment was estimated to increase to 28.4 FTE workers with associated earnings of \$0.7 million and increased output of \$1.9 million, as measured in 1991 dollars.

See tables 1 – 16 on the following pages for specific data.

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INDEX

- ADFG 16, 80-91, 93, 94, 101, 136, 138, 140, 167, 170, 183, 236, 264
- ADT 121, 135, 165, 278, 287, 317
- Ahtna 1, 3, 27, 31, 107, 117, 163, 176, 223, 225, 312, 313, 317
- air quality 63, 75, 142-144, 162, 172, 186, 202, 214, 310
- Alaska Department of Fish and Game 16, 18, 81, 83, 89, 91, 93, 100, 141, 171, 184, 236, 263, 304, 305, 312, 313, 317
- Alaska Department of Natural Resources 16, 18, 106, 107, 164, 166, 236, 278, 287, 305, 312, 313, 318
- Alaska Department of Transportation and Public Facilities 26, 65, 112, 113, 148, 153, 155, 165, 236, 244, 278, 287-289, 305, 312, 313
- Alaska Railroad 16, 56, 89, 97, 98, 100, 109, 118, 120, 165, 169, 193, 225, 229, 242, 272, 275, 280, 318
- Alaska Range 11, 16, 17, 20, 31, 35, 73, 75, 79, 82, 86, 94, 97, 123, 137, 149, 160, 221, 239, 263, 277, 278, 318
- Alder Creek 83, 85, 92, 318
- Alder Point 17, 84, 318
- Anchorage 21, 75, 97, 100, 102, 104, 109, 112, 113, 118, 120, 124, 140, 148, 161, 166, 221-225, 275, 279, 280, 282-285, 289, 304-309, 311, 318
- Anderson Pass 86, 318
- archeological 22, 51, 53, 54, 64, 96, 97, 145, 173, 187, 203, 215, 309, 318
- ATVs 34, 49, 124, 129, 165, 318
- average daily traffic 121, 165, 278, 287, 317
- backcountry 3, 11, 17, 19, 22, 23, 27, 32, 35, 41, 42, 51, 52, 66, 80, 107, 120, 123-125, 131, 132, 137, 145, 148, 149, 160, 161, 166, 167, 180, 241, 250-252, 264, 275, 278, 309, 310, 318
- baseline growth 67, 153, 159, 162, 164, 190, 284, 286, 318
- black bears 81, 82, 84, 85, 131, 133, 135, 138, 168, 180, 183, 198, 200, 211, 212, 307, 318
- Board of Game 69, 82, 174, 236
- boating 26, 111, 166, 284, 318
- boundaries 3, 16-18, 31, 79, 90, 97, 107, 116, 117, 119-121, 124, 125, 165, 167, 238, 240, 241, 263, 318
- Bull River 84-87, 89, 99, 136, 146, 242, 318
- Byers Lake 16, 36, 40, 41, 43, 45, 50, 56, 57, 84, 85, 92, 100, 119-121, 133, 134, 165, 180, 181, 216, 229, 240, 245, 278, 283, 287, 318
- cabin 35, 42, 50, 58, 98, 114, 145, 161, 187, 203, 210, 212, 215, 216, 241, 287, 318
- calving 41, 51, 60, 82, 86-89, 134, 137, 138, 146, 169, 181, 242, 264, 308, 318
- calving grounds 51, 60, 86, 87, 89, 137, 138, 146, 169, 242, 308, 318
- Camp Creek 76, 77, 86, 87, 172, 318
- campgrounds 11, 31, 33, 40, 45, 48, 50, 55-57, 104, 105, 117, 119, 120, 133, 145, 147, 161, 164, 168, 173, 177, 178, 188, 196, 203, 208, 237, 243, 249, 275, 283-285, 318
- camping facilities 12, 40, 52, 118
- campsites 35, 40, 50, 59, 119, 130-134, 137, 141, 148, 168, 179, 197, 240, 245, 246, 318
- Cantwell 3, 11, 19, 21, 32, 60, 64, 67, 68, 73, 79, 86, 87, 89, 99-102, 107, 116, 118, 119, 124, 135, 137, 138, 146, 147, 159, 160, 163, 168, 169, 176, 177, 194, 195, 207, 208, 221-223, 241, 242, 308, 309, 318
- caribou 11, 22, 32, 41, 51, 59, 60, 81, 85-87, 89, 90, 96, 100, 101, 136-138, 146, 161, 167, 169, 182, 199, 212, 237, 239, 241, 242, 264, 304-309, 311, 318
- central development zone 8, 40, 41, 43, 45, 48, 56, 57, 61, 66, 84, 85, 89, 91, 129, 130, 132-134, 140, 142, 147, 148, 151, 161, 179, 182, 184, 191, 193, 195, 197, 199, 200, 210, 212, 240, 241, 283, 318
- Chelatna Lake 11, 35, 36, 40-43, 46, 49, 50, 56-58, 61, 73, 76, 80, 81, 83-86, 88-93, 100, 102, 130, 132-134, 137, 138, 140-142, 146, 147, 161, 167, 210, 212, 215, 216, 229, 239-242, 246, 287, 318
- Chulitna River 8, 17, 41, 43, 50, 57, 58, 62, 74, 79, 82, 83, 86, 89-92, 97, 120, 134, 141, 146, 165, 166, 181, 182, 199, 210, 213, 215, 241, 242, 263, 274, 283, 287, 318
- Cook Inlet Region, Inc. 3, 18, 27, 31, 36, 106, 163, 318
- Cripple Creek 73, 76, 77, 80, 83, 85, 92, 172, 318
- Dall sheep 11, 22, 24, 51, 81, 167, 237, 239, 305, 308, 309, 318
- Denali Borough 3, 11, 21, 27, 67, 68, 102, 107, 116-118, 159, 163, 164, 176, 177, 194, 207, 216, 225, 312, 313, 318
- Denali fault 73, 80, 84, 97, 318
- Denali herd 85-87, 137, 318
- Denali National Park 3, 11, 17-20, 24, 31-33, 35, 37, 40, 41, 43, 46, 55, 57, 68, 73, 75, 76, 96-100, 107, 111, 116, 117, 119-122, 125, 132, 133, 135, 137, 143, 146, 148, 149, 159-161, 163-165, 177, 188, 194-196, 203, 204, 207, 208, 216, 217, 221, 223, 224, 236-244, 274-278, 280, 282-289, 305, 307-313
- Denali park road 189, 279, 318
- Denali State Park 3, 8, 11, 14, 16-20, 24, 26, 27,

- 32-35, 37, 40, 41, 43, 45, 46, 48-50, 55-58, 61, 64, 66-68, 74-76, 80-83, 85-89, 91, 93, 94, 98, 104-107, 114, 118-120, 124, 125, 129, 130, 137, 140, 142, 148, 149, 159-161, 164, 166, 167, 177, 179, 181, 182, 184, 185, 187-189, 191-197, 199, 202-208, 210, 212, 213, 215, 216, 222, 229, 235-237, 239-243, 248, 253, 264, 274, 278, 279, 283, 285-287, 291, 304, 305, 307, 309, 313, 318
- Division of Parks and Outdoor Recreation 17, 36, 106, 107, 120, 124, 167, 222, 224, 225, 236, 304, 305, 311-313
- drainages 52, 76, 82, 87, 89, 96, 100, 165, 318
- Dunkle mine 74, 80, 84, 85, 87, 89, 97, 98, 119, 137, 242, 318
- Dutch Hills 79, 80, 86, 88, 97, 124, 165-167, 242, 318
- Eldridge Glacier 17, 43, 73, 125, 167, 318
- EMS 26, 114, 153
- Fairbanks 21, 75, 97, 117, 120, 124, 165, 221-223, 225, 275, 280, 283, 306, 308, 310, 311, 318
- fault 73, 80, 84, 87, 97, 318
- fire 26, 66, 109, 112, 114, 116, 118, 153, 155, 157, 158, 175, 191-193
- fish 16-18, 20, 22, 26, 51, 61, 62, 64, 69, 81-83, 89, 91-93, 96, 99, 100, 110, 140-142, 144-147, 161, 162, 167, 171, 173, 178, 181, 184, 185, 188, 201, 202, 204, 213, 214, 222, 224, 225, 236, 237, 239, 241-243, 263, 269, 284, 304-306, 311-313, 317
- fishing 23, 54, 62, 69, 80, 82, 93, 96, 99, 113, 116, 118, 124, 134, 141, 146, 147, 161, 166, 167, 171, 173, 184, 185, 201, 213, 214, 236, 241-243, 264, 278, 281, 284, 318
- flightseeing 11, 23, 24, 49, 111, 123, 124, 152, 160, 167, 193, 276, 279, 288, 318
- floodplains 24, 76, 89, 237, 318
- general management plan 11, 17, 19, 22, 122, 146, 188, 204, 241-243, 275, 309, 319
- geology 73, 77, 161, 319
- George Parks Highway 3, 7, 16, 17, 19, 26, 27, 31, 33-37, 39, 40, 43, 46, 49, 50, 55, 56, 61, 64, 67-69, 74, 75, 80, 84, 85, 87, 89, 90, 97, 100, 103, 105-107, 109, 112-121, 123-125, 129-131, 134, 135, 137, 141, 143, 145, 147, 149-152, 155, 156, 158-168, 173-177, 179-182, 184, 186-191, 193, 195-200, 202-205, 210, 211, 213, 215, 229, 235, 236, 240, 242, 243, 248, 275, 278, 280, 282-287, 291, 319
- Golden Zone 41, 73, 84, 166, 319
- grizzlies 82-85, 133-135, 168, 310, 319
- grizzly bear 11, 22, 59, 81-84, 131-133, 180, 182, 198, 211, 306-308, 319
- Healy 21, 118, 164, 176, 223
- hiking 17, 23, 35, 40, 41, 43, 45, 46, 48, 50, 57, 64, 80, 111, 112, 119, 124, 125, 134, 136, 147, 148, 161, 162, 166, 167, 169, 181, 196, 197, 204, 208, 229, 240, 242, 284, 319
- historic 22, 23, 51, 53, 54, 60, 64, 96-98, 109, 137, 138, 145, 146, 166, 169, 173, 187, 188, 203, 215, 224, 225, 236, 242, 309
- hotel 11, 16-19, 105, 109, 111, 120, 125, 148, 150-152, 154, 157, 161, 164, 166, 173, 174, 177, 188-191, 193-196, 204, 205, 274, 275, 279-284, 286, 290, 309, 319
- housing 7, 37, 43, 65, 102, 110, 113, 114, 116, 118, 130, 133, 143, 148, 151, 152, 155, 156, 158-160, 173, 176, 177, 190-195, 205-208, 249, 319
- hunting 23, 26, 54, 59-61, 69, 80, 82, 84-86, 88, 96, 99, 100, 111, 113, 115, 118, 135-139, 146, 147, 161, 162, 166-170, 173, 174, 182, 183, 199, 200, 211, 212, 236, 241-243, 264, 278, 279, 281, 288, 305, 306, 308, 319
- IMPLAN 148, 151, 190, 204, 289-291, 307, 319
- infrastructure 152, 174, 278, 282, 284, 319
- interpretation 20, 31, 37, 41, 43, 45, 50, 136, 148, 157, 161, 166, 169, 189, 204, 240, 242, 250, 313, 319
- interpretive 3, 12, 19, 23, 33, 35, 36, 39-41, 43, 45, 46, 48, 52, 55, 57, 68, 106, 134, 148, 152, 161, 162, 166, 181, 188, 191, 195-197, 204, 205, 208, 217, 229, 240, 245-248, 250-252, 319
- jobs 16, 66, 102, 111, 113, 116, 148, 151, 152, 154-160, 190-194, 205-208, 319
- Kesugi Ridge 8, 319
- landowners 19, 25, 152, 223, 319
- landownership 11, 106-108, 111, 120, 319
- legislative 19, 31, 146, 188, 204, 242, 243, 312, 313, 319
- Long 11, 16, 31, 36, 39, 41, 50, 57, 60, 63, 67, 73, 74, 76, 77, 89, 98, 104, 122-124, 130, 137-139, 143, 144, 156, 159-162, 166, 169, 172, 174, 177, 178, 183, 186, 187, 194, 195, 202, 207, 214, 229, 237, 241, 242, 275, 276, 280, 319
- Matanuska-Susitna Borough 3, 11, 16, 18, 21, 27, 33, 36, 49, 50, 54, 57, 65-67, 97, 102-107, 109, 111-114, 116, 117, 119, 124, 129, 148, 152-160, 163-166, 174-176, 188, 191-194, 204, 205, 207, 210, 212, 214-217, 222, 235, 236, 241, 279, 287, 288, 305, 307, 312, 313, 319
- mine 43, 73, 74, 80, 84, 85, 87, 89, 97, 98, 117, 119, 137, 166, 242, 318, 319
- mining 7, 16, 26, 27, 33, 34, 41, 49, 54, 55, 74, 76, 88, 97, 98, 102-104, 107, 109, 113, 115-120, 124, 136, 145, 152, 155, 157, 162, 163, 165-172, 174-176, 187, 188, 203, 240, 242, 305, 308, 319
- moose 11, 22, 32, 51, 60, 61, 79, 81-83, 87-90, 92, 100, 101, 133, 134, 138, 139, 146, 161, 166, 167, 169, 170, 178, 181-183, 199, 200, 212, 236, 237,

- 239, 241, 242, 264, 278, 287, 304-306, 308, 309, 319
- Mount McKinley 11, 16, 31, 40, 43, 73, 75, 76, 97, 99, 109, 111, 123, 149, 158, 160, 167, 237, 241, 279, 282, 283, 288, 290, 306, 319
- ORVs 143, 154, 186, 319
- parking 7, 8, 18, 31, 34, 37, 40, 41, 43, 46, 49, 50, 57,
63, 68, 105, 106, 124, 129, 130, 133, 143, 161,
164, 179, 197, 210-214, 216, 217, 241, 245, 247,
248, 287, 319
- pedestrians 39, 136, 140, 319
- permits 54, 123, 124, 152, 160, 167, 189, 237, 276,
286, 319
- Peters Hills 82, 88-90, 97, 100, 104, 107, 124, 138,
152, 174, 242
- Petersville 7, 8, 11, 16, 24, 26, 27, 33, 35-37, 39, 43,
46, 49, 50, 55-57, 60, 63, 64, 66, 68, 69, 74,
79-81, 83, 85, 86, 88-90, 94, 97, 102-109,
113-116, 119-121, 124, 129-133, 135, 138, 139,
141-144, 147-158, 161-168, 170-178, 182, 186,
192-194, 206, 210, 212, 214-217, 229, 235, 236,
241, 249, 250, 278, 279, 282, 283, 287-289, 319
- Petersville Road 7, 8, 11, 16, 24, 26, 27, 33, 35-37,
39, 43, 46, 49, 50, 55-57, 60, 63, 64, 68, 69,
79-81, 83, 85, 86, 88-90, 94, 97, 103-109,
113-116, 119-121, 124, 129-133, 135, 138, 139,
141-144, 147-158, 161-168, 170-175, 177, 178,
182, 186, 194, 210, 212, 214-217, 229, 235, 236,
241, 249, 250, 278, 279, 282, 283, 287-289, 319
- picnic areas 36, 45, 46, 52, 119, 168, 319
- rafting 80, 111, 123, 152, 166, 264, 276, 319
- railroad 16, 56, 84, 85, 89, 97, 98, 100, 109, 118-120,
165, 169, 193, 225, 229, 242, 272, 275, 280, 318,
319
- recreation 3, 7, 11, 12, 16-20, 24, 33, 35, 36, 39, 49,
50, 55, 60, 61, 74, 80, 89, 100, 105-107, 109, 111,
112, 119-122, 124, 125, 135, 138, 140, 146, 148,
151, 153, 155-157, 159, 164, 167, 168, 174, 180,
183, 184, 191, 194, 195, 201, 205, 210, 222, 224,
225, 229, 235, 236, 239, 242, 275, 278, 279, 281,
284, 285, 287, 288, 290, 304-306, 309-313
- recreational vehicles 37, 319
- restrooms 34, 37, 40, 43, 46, 49, 106, 151, 176, 194,
319
- Riley Creek 84, 86, 87, 319
- riparian 86, 88, 90, 167, 171, 319
- roadside exhibits 33, 35, 43, 46, 53, 55, 131, 137,
145, 161, 187, 203, 221, 246-248, 284, 319
- Ruth Glacier 17, 73, 83, 84, 119, 124, 125, 167, 319
- RVs 37, 40, 43, 46, 129, 151, 160, 179, 195, 197,
245, 247, 248, 284, 285, 319
- safety 26, 32, 33, 40, 41, 55, 57, 69, 105, 135, 147,
154, 237, 319
- scoping 21, 22, 221, 223, 319
- southern development zone 8, 43, 45, 46, 50, 56, 57,
74, 84, 85, 89, 91, 94, 179, 180, 182, 188, 189,
191, 197, 198, 204, 206, 210, 213, 240, 283, 320
- staging 52, 140, 158, 184, 320
- subsistence 18, 20, 23, 32, 33, 55, 60, 61, 64, 99,
100,
103, 117, 137-139, 146, 147, 156, 161, 163, 169,
170, 173, 174, 176, 188, 192, 203, 204, 215, 237,
239, 241-243, 304, 305, 313, 320
- Summit 43, 75, 76, 85, 91, 107, 320
- surveys 23, 51, 52, 54, 62, 76, 78, 80, 81, 90, 93, 94,
96, 104, 119, 142, 166, 171, 185, 201, 224, 244,
320
- Talkeetna 3, 11, 18, 19, 21, 31, 32, 40, 49, 56, 66,
67,
74-76, 86, 88, 89, 92, 97, 98, 100-102, 106,
109-115, 121, 123, 124, 129, 135, 145, 158-160,
163-165, 167-169, 176, 187-189, 193, 194, 203,
204, 207, 215, 217, 221-225, 229, 235, 237, 240,
242, 243, 263, 278-280, 283-288, 306, 309-311,
313, 320
- Talkeetna Junction 114, 121, 280, 320
- Tokositna 7, 16-18, 23, 25, 35-37, 39-43, 46, 49, 50,
56, 57, 61, 64, 67, 73, 74, 76, 77, 79-86, 88-94,
100, 104, 107, 119, 124, 129, 130, 132-135,
138-143, 146-151, 155-158, 161-163, 166-168,
173, 175, 177, 182, 186, 190, 194, 196, 229, 239,
240, 242, 244, 245, 249, 263, 264, 277-283, 286,
288, 290, 304, 305, 309-311, 320
- Tokositna Glacier 16, 74, 83, 85, 94, 119, 133, 142,
263, 320
- Tokositna River 17, 36, 74, 76, 77, 79-81, 83-85,
88-93, 135, 138, 166-168, 263, 309, 310, 320
- traffic 11, 63, 67, 68, 109, 120-123, 131, 135, 136,
139, 143, 153, 154, 159, 160, 165, 170, 175-177,
182, 186, 189, 191, 192, 202, 206, 214, 275, 276,
278, 280, 286, 287, 311, 317, 320
- trail 8, 17, 24, 32, 35, 41, 45, 48, 50, 52, 53, 57, 62,
68, 88, 115, 119, 124, 130, 132, 134, 145-147,
149, 161, 179-181, 187, 195, 197, 203, 210, 212,
213, 215, 229, 239-242, 250-253, 278, 289, 320
- trailhead 35, 41, 42, 57, 124, 130, 133, 136, 137,
146,
147, 239, 240, 242, 246, 320
- trails 3, 12, 17, 19, 23, 24, 31, 32, 34-36, 39, 41, 43,
45, 46, 48-50, 52, 53, 57, 59, 64, 68, 96, 104-106,
112, 124, 130-134, 138-141, 145-148, 154, 161,
162, 164, 167, 168, 177-179, 181-184, 187, 188,
195-197, 203, 204, 208, 210, 216, 221, 229, 235,
239, 240, 242, 243, 245-248, 284, 319, 320
- transportation 3, 18, 26, 27, 65, 99, 102-104, 106,

- 109-114, 116, 118, 120, 122, 123, 148, 151-153, 155, 158-160, 163, 165, 174, 176, 190-192, 205, 208, 216, 222, 225, 235, 236, 238, 244, 274, 275, 278-280, 287-290, 305, 312, 313, 320
- Trapper Creek 21, 66, 68, 89, 92, 102, 107, 109, 113-115, 119, 121, 135, 153-158, 161-165, 175, 176, 191-193, 206, 221-223, 225, 278, 287, 320
- vegetation 11, 22, 33, 41, 45, 48, 51-53, 59, 73, 79, 80, 82-85, 94, 124, 129-131, 133, 134, 141, 142, 145-147, 152, 161, 167, 168, 171, 178-181, 184, 197, 198, 210, 211, 229, 239, 242, 313, 320
- vegetative 27, 33, 49, 53, 76, 105, 119, 131, 179, 197, 229, 235, 320
- visitor center 3, 7, 8, 16-19, 23, 31, 32, 35-37, 39-43, 45, 46, 48, 50, 56, 57, 66-68, 110, 111, 119, 129, 130, 133, 141, 143, 147-151, 157-161, 177, 179, 180, 182, 184, 185, 188-200, 204-208, 221, 229, 237, 240, 245, 247, 249-252, 278-291, 309, 311, 320
- vista clearing 33, 59, 130, 131, 133, 179, 182, 197, 199, 210, 320
- Troublesome Creek v, 8, 33, 88, 92, 134, 320
- trumpeter swans 22, 61, 81, 90, 140, 170, 171, 178, 184, 200, 201, 213, 320
- utilities 37, 40, 43, 46, 102, 103, 110, 116, 117, 129, 130, 133, 179, 250-253, 284, 289, 320
- wilderness 17, 24, 32, 119, 225, 236, 237, 239, 241, 274, 309, 320
- wildlife 7, 11, 17, 20, 22, 26, 27, 33, 35, 39-42, 45, 48-52, 55, 62, 64, 69, 80, 81, 83, 84, 91, 93, 100, 122, 135, 136, 139, 142, 144, 146, 147, 149, 162, 171, 173, 174, 178, 183, 185, 188, 200-202, 204, 216, 222, 224, 225, 229, 236, 237, 239, 241-243, 264, 265, 269, 275, 278, 304-308, 310-313, 320
- Windy Creek 32, 86, 87, 89, 98, 99, 137, 145, 146, 187, 203, 215, 242, 320
- winter range 51, 60, 87, 88, 138, 139, 183, 200, 320
- wolves 22, 61, 81, 90, 139, 140, 170, 183, 184, 200, 212, 213, 237, 239, 309-311, 320
- Wonder Lake 86, 97, 121, 275, 320