National Park Service
U.S. Department of the Interior

Denali National Park and Preserve
Alaska

Headquarters Area Plan
Environmental Assessment
September 2007

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September 2007

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1.0 PURPOSE AND NEED

1.1 Purpose and Need for Action

The National Park Service is developing a Headquarters Area Plan to provide detailed guidance and an integrated plan for developments in the headquarters area of the park (see Figure 1-1 Project Area) including the Headquarters Historic District, an area listed on the National Register of Historic Places. The guidance is needed to complete implementation of components of the 1997 *Entrance Area and Road Corridor Development Concept Plan (DCP) and Environmental Impact Statement* including the recommendations of the *Cultural Landscape Report* for the Headquarters Historic District. It also addresses residential housing and administrative facility needs in the headquarters area that have arisen since completion of the of the 1997 DCP.

The *Entrance Area and Road Corridor DCP* called for several changes in administrative facilities and visitor amenities in the headquarters area that have not been completed, including construction of new administrative office space, upgrade and expansion of the headquarters utility systems, and construction of new residential garages and administrative parking. The DCP also called for rehabilitation of Headquarters Historic District landscape and provision of new interpretive opportunities potentially including signs, wayside exhibits, and walk-through tours. These projects were intended to accomplish the goal of the DCP to provide a wide range of frontcountry opportunities to meet visitor needs and interests. The DCP also provided for the administrative infrastructure necessary to efficiently support visitor services and park resource management.

The final 2007 *Cultural Landscape Report for the Headquarters Historic District* makes recommendations for one component of the DCP: the rehabilitation of the Headquarters Historic District landscape. Implementing report recommendations would accomplish the goals of the DCP while fulfilling NPS responsibilities to preserve and rehabilitate cultural resources by returning the Headquarters Historic District landscape to a form closer to its appearance during its period of significance (1928-1941).

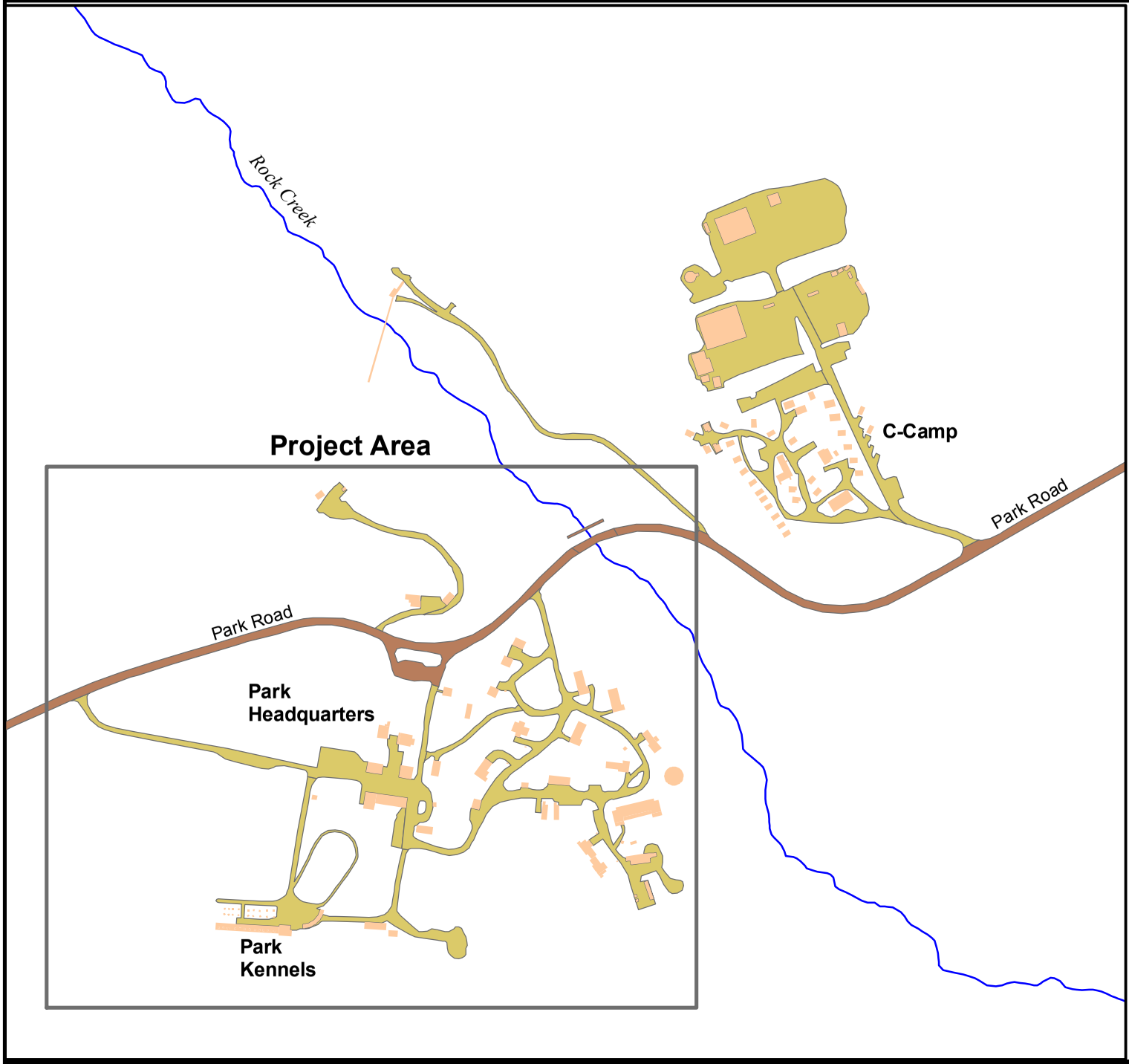
There are additional issues that have arisen since completion of the 1997 DCP and need to be integrated into the plan for the area. Historic building renovations have increased office space, but have not provided sufficient storage in the headquarters area. There is an unanticipated need to support the park's information technology (IT) infrastructure and staff, which have expanded substantially in the last ten years. The long-term movement of some administrative offices – including the IT office – into the residential area also creates parking conflicts with residents. There is a need to provide trailer pads and hookups for park volunteers who wish to live out of their personal recreational vehicles during their volunteer employment. Finally, the 2006 Backcountry Management Plan called for construction of a warming hut adjacent to the headquarters visitor parking lot which needs to be integrated with the rest of the plan.

This document offers two alternatives for providing integrated, detailed solutions to these needs in order to further the goals of the 1997 *Entrance Area and Road Corridor DCP*. A no-action alternative is also provided for the purposes of evaluating environmental and operational consequences.

Figure 1-1 -- Location Map

Headquarters Area

Alaska Region
National Park Service
U. S. Department of the Interior



National Park Service
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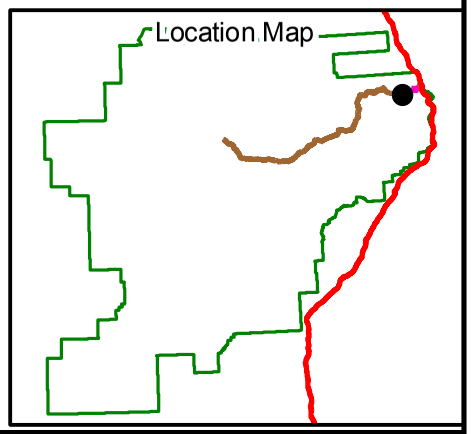

1.2 Background

The 1997 *Entrance Area and Road Corridor Development Concept Plan, Environmental Impact Statement, and General Management Plan Amendment* described a variety of actions to provide frontcountry visitor facilities and services designed to meet a wide range of visitor needs and interests to be implemented over 15-20 years. These proposals were limited to actions in which the National Park Service has traditionally specialized such as interpretive centers, environmental education opportunities, trails, and campgrounds. The actions also included upgrades to the administrative infrastructure necessary to support expanded visitor facilities and associated resource protection needs. For the headquarters area, the plan called for infrastructure upgrades and rehabilitation, some construction of new administrative and residential facilities, and increased interpretive opportunities in the Headquarters Historic District. Specific projects included the following:

1) Rehabilitation of Headquarters Historic District landscape and provision of new interpretive opportunities potentially including signs, wayside exhibits, and walk-through tours.
2) Rehabilitation of all buildings in the Headquarters Historic District.
3) Establishment of a year-round visitor contact station in existing maintenance office near the visitor parking area.
4) Construction of additional employee parking northeast of the kennels for 20 vehicles.
5) Construction of a 5,000 square-foot administrative building to replace an existing building that presently houses the park library and communications center.
6) Replacement of C-Camp and headquarters leach fields with one package sewage treatment plant in the headquarters area.
7) Expansion of utility systems in the headquarters area to serve additional structures such as the new office building and the comfort station in the kennels area.
8) Upgrading of headquarters utility systems including electrical and water.
9) Construction of three two-car garages in the employee housing area.
10) Construction of a comfort station to accommodate visitors to the kennels and the Headquarters Historic District.

Of these projects, most of the historic buildings have been rehabilitated with the exception of the superintendent's house (building 23), the main headquarters office (building 21), the "Upfront" (building 110), and one residence (building 22). The comfort station for the kennels was constructed in 2005, but was constructed as a stand-alone "SST" facility which did not require a utility system extension for service. The establishment of a year-round visitor contact station became unnecessary because the Murie Science and Learning Center was developed to serve as a winter visitor center.

Other projects have not been completed. In order to advance and better inform the first goal listed above – to rehabilitate the Headquarters Historic District landscape and provide interpretive opportunities in the district – the National Park Service asked its Olmsted Center for Landscape Preservation to prepare a Cultural Landscape Report for the district. The Olmsted Center's report contained recommendations in three categories designed to restore the landscape to more closely resemble its period of significance (1928-1941), to allow productivity of the

district as administrative space to continue while preserving historic character, and to enhance opportunities for visitors to experience the district. Specific recommendations may be summarized as follows:

1. Parking and Circulation
    - Eliminate parking and through-traffic from the center of the historic district and relocate administrative parking to the perimeter.
    - Enhance and protect roadside vegetation throughout the historic district.
    - Improve sight-distances at the intersection of the park road and headquarters road.

2. Buildings and Structures
    - Ensure the location, scale, and character of new buildings adjacent to the historic district are compatible with the district.

3. Small-Scale Features
    - Develop and install a palette of non-historic park fixtures that are appropriate to the historic character of the historic district.

The *Cultural Landscape Report* recommended specific actions to be taken to achieve each of these goals. These actions are incorporated into alternatives for analysis in section 2.

Other concerns that have emerged since the completion of the 1997 DCP are derived from other plans, were unforeseen consequences of DCP implementation, or related to changing administrative and residential needs that were not anticipated in 1997. The 2006 *Backcountry Management Plan, Environmental Impact Statement, and General Management Plan Amendment* identified provision of a warming hut and vehicle plug-ins at the headquarters visitor parking lot as an important project for enhancing winter visitor opportunities, but did not specify a specific location for the hut although it could have an impact on the entrance to the historic area.

Since the purpose and need were described for the 1997 DCP, the park's information technology (IT) infrastructure and personnel have grown dramatically. A one-person staff in 1997 is now a 3-person year-round staff and 1 seasonal employee. Additional personnel combined with additional technology requirements have resulted in the conversion of residential garages to an IT facility that occupies four of six bays in building #53. However, this space is inadequate and poorly configured, and has been a loss for residential storage. The rehabilitation of several historic buildings, particularly building #106, has resulted in more headquarters office space but inadequate headquarters-area storage space to support the functions located there.

Analysis for building and utility rehabilitation in the headquarters area has led to the installation of individual propane-fueled furnaces in many headquarters buildings, and ultimately all of them will have such furnaces. This process will render the park's steam plant (building 54) obsolete, which has beneficial financial and environmental benefits for the park. Optimal re-use of the steam plant structure is a consideration within the scope of the headquarters plan.

Volunteers in Parks (VIPs) are important for the National Park Service to meet staffing needs for visitor facilities and programs. Many VIPs are older retirees who bring their own recreation vehicles (RVs) or trailers to live in of during the season while volunteering. The National Park Service considered providing parking for VIP trailers or RVs in C-Camp as part of the *C-Camp Improvements Environmental Assessment*. However, the alternative chosen for implementation did not address that need, which remains unmet.

The six-unit apartment building (B51) was constructed in 1959. It is presently in need of replacement or rehabilitation.

1.3 Legal Context

The 1916 Organic Act directed the Secretary of the Interior and the NPS to manage national parks and monuments to:

> "…conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations." (16 U.S.C. 1)

The Organic Act also granted the Secretary the authority to implement "rules and regulations as he may deem necessary or proper for the use and management of the parks, monuments and reservations under the jurisdiction of the National Park Service." (16 U.S.C. 3)

In 1917, Congress established Mount McKinley National Park:

> "…as a public park for the benefit and enjoyment of the people . . . for recreation purposes by the public and for the preservation of animals, birds, and fish and for the preservation of the natural curiosities and scenic beauties thereof . . . said park shall be, and is hereby established as a game refuge". (39 Statute 938).

1978 amendments to the 1916 NPS Organic Act and 1970 NPS General Authorities Act expressly articulated the role of the national park system in ecosystem protection. The amendments further reinforce the primary mandate of preservation by stating:

> "The authorization of activities shall be construed and the protection, management, and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided for by Congress." (16 U.S.C. 1-a1)

The Alaska National Interest Lands and Conservation Act of 1980 (ANILCA) added approximately 2,426,000 acres of pubic land to Mt. McKinley National Park and approximately 1,330,000 acres of public land as Denali National Preserve and re-designated the entirety Denali National Park and Preserve. ANILCA directs the NPS to preserve the natural and cultural resources in the park and preserve for the benefit, use, education, and inspiration of present and

future generations. The Act further directs the NPS to manage for the continuation of customary and traditional subsistence uses in the park and preserve additions in accordance with provisions in Title VIII.

The 1966 National Historic Preservation Act, as amended, provides direction to federal agencies for protection of historic resources. Section 106 of the act requires consideration of adverse impacts to historic resources during the course of any federal undertaking. Section 110 provides for an affirmative role of federal agencies in identifying, preserving, and utilizing the historic properties that are in agency ownership.

The NPS Organic Act and the General Authorities Act prohibit impairment of park resources and values. The 2001 NPS Management Policies uses the terms "resources and values" to mean the full spectrum of tangible and intangible attributes for which the park is established and managed, including the Organic Act's fundamental purpose and any additional purposes as stated in the park's establishing legislation. The impairment of park resources and values may not be allowed unless directly and specifically provided by statute. The primary responsibility of the NPS is to ensure that park resources and values will continue to exist in a condition that will allow the American people to have present and future opportunities for enjoyment of them.

The evaluation of whether impacts of a proposed action would lead to an impairment of park resources and values is included in this environmental assessment. Impairment is more likely when there are potential impacts to a resource or value whose conservation is:

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

1.4 Issues

To focus the environmental assessment, the NPS selected specific issues for further analysis and eliminated others from evaluation. A listing of environmental concerns identified during scoping is below. Scoping for this project included both internal discussions as well as opportunities for public input, as described under section 5, Consultation and Coordination. These concerns are fully evaluated in section 4, Environmental Consequences.

Air Quality
Local air quality could be affected by heavy machinery emissions during construction activities.

Vegetation, Soils, and Wetlands
Mixed white spruce and hardwood forest vegetation could be removed or disturbed during construction activities proposed in the headquarters area. Existing soil strata could be altered or removed and land contours could be changed as a result of road realignments and new building and parking lot construction. Wetland areas could be disturbed.

Wildlife and Habitat
Headquarters area construction could reduce wildlife habitat. Construction activities could temporarily produce noise and activity levels that could disturb wildlife and cause dispersal from adjacent areas during the construction period.

Cultural Resources
New construction and landscaping could occur in or near the Headquarters Historic District, which is listed on the National Register of Historic Places, and could affect those resources.

Night Sky/Natural Lightscape
Additional lighting in the headquarters area could affect night sky visibility.

Visitor Use and Recreation
Visitor activities in the headquarters area could be temporarily disrupted by construction activity. Visitor opportunities could be altered by the changes made to the Headquarters Historic District.

Local Communities and Local Economy
Construction activities could have impacts on local community resources and local businesses.

Park Management
Management activities in the headquarters could be temporarily disrupted by construction activity, and permanently changed by revised patterns of parking and circulation and the addition of office space and storage space.

1.5 Issues Eliminated from Further Consideration

Threatened and Endangered Species
The Endangered Species Act requires an analysis of impacts on all federally listed threatened and endangered species, as well as species of special concern. In compliance with Section 7 of the Act, the U.S. Fish and Wildlife Service (USFWS) has been consulted. No federally-designated threatened or endangered species are known to occur within Denali National Park (Swem, 2000), and none are anticipated to be affected by this plan.

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

Floodplains
No floodplains exist in the project area. Executive Order 11988 (Floodplain Management) is not addressed in this Environmental Assessment.

Subsistence
Subsistence is eliminated from further evaluation because subsistence activities are not allowed in the project area. As required by ANILCA §810 an evaluation is attached in Appendix B.

Wilderness
The proposed areas for the expansion and improvements to the headquarters area of Denali National Park and Preserve are not located inside designated wilderness boundaries. All project areas were found not suitable for wilderness designation (NPS, 1986) and none were proposed for wilderness designation in any of the alternatives in the Environmental Impact Statement on *Wilderness Recommendations for Denali National Park and Preserve* (NPS 1988). Additionally, noise generated by project activities would not be expected to affect solitude in any adjacent wilderness areas.

1.6 Permits and Approvals Needed to Complete the Project

Permits would be needed from the Alaska Department of Environmental Conservation for wastewater and solid waste disposal.

2.0 ALTERNATIVES

This section describes a no-action alternative and two integrated alternatives for addressing the needs in the headquarters area. Also discussed are any alternatives and actions that have been considered but dismissed from further analysis.

The alternatives were developed during project scoping with the public and National Park Service staff. General actions were prescribed by the *Entrance Area and Road Corridor Development Concept Plan* (NPS 1997), and many specific proposals were derived from the *Cultural Landscape Report for the Headquarters Historic District* (NPS 2007a) prepared by the NPS Olmsted Center for Landscape Preservation. Alternatives were developed to the degree necessary to understand the overall impact of the development and rehabilitation plans on park resources, visitor experience, and park management and operations. Specific landscape, architecture, and engineering designs would be required prior to construction.

Maps 2-1, 2-2, and 2-3 and Table 2-1 summarize the components and attributes of each alternative. Table 2-2 summarizes the predicted impacts for each alternative on the issues of concern.

2.1 Alternative 1: No Action

The "no action" alternative is presented for comparative purposes so that the impact of maintaining current conditions can be compared to the impact of the alternatives. See Figure 2-1.

2.1.1 Administrative and Visitor Facilities

- The pipe storage racks and existing shed would remain in place east of the kennels building. No new kennel storage building would be constructed.
- The Communications Center Building (B141) would not be removed, and no new administrative building would be constructed in its place.
- No warming hut or SST would be constructed at the visitor parking lot.
- The 6-bay garage unit (B53) used by the park's Information Technology staff would not be enlarged, nor would the steam plant be remodeled to accommodate IT staff and storage.

2.1.2 Residential Facilities.

- No new parking garages would be constructed.
- The six-plex apartment building (B51) would be retained in its current condition.

2.1.3 Parking and Circulation

- Parking would be retained in the core headquarters area and no new parking lots would be constructed.
- Existing circulation patterns through the headquarters area would be retained, including the one-way through-traffic of sled dog demonstration buses entering along the service road and exiting by way of the main headquarters driveway.
- The road behind between the administrative and residential areas of headquarters, behind the Superintendent's house (B23) would remain a vehicular road.

- The historic turnaround loop at the south end of the headquarters driveway would not be reestablished.
- The service road would not be realigned.
- There would be no VIP trailer sites established in the headquarters area.
- The kennels access road would not be reestablished behind the sled dog demonstration viewing stands.

2.1.4 Maintenance and Utilities

- The steam plant-utilidor system would remain as the utility infrastructure backbone for the headquarters area.
- C-Camp waste would not be piped to headquarters and the headquarters leach field would not be expanded.
- There would be no new installation of outdoor lighting in the headquarters area.

2.2 Common to All Action Alternatives

Actions common to all action alternatives support both action alternatives. These actions largely address utility upgrades and implications, the siting of structures already described in the 1997 *Entrance Area and Road Corridor DCP,* and new sled dog demonstration bus circulation and parking that would remove that traffic from the core headquarters area and for which only one viable alternative was identified. Sight distance concerns at the junction of the park road and headquarters driveway would be resolved through vegetation thinning. Very importantly, these actions would remove excess bituminous pavement from the Headquarters Historic District and require use of the fixtures, vegetative screening, and other landscape elements recommended by the *Cultural Landscape Report for Park Headquarters* (NPS 2007a). Specific actions include the following:

2.2.1 Buildings and Facilities

- The historic and non-historic buildings, landscape and roads in the historic district and nearby area would be rehabilitated and cyclic maintenance would continue.
- The pipe storage and dilapidated shed structure at the south end of the headquarters driveway would be removed and an 800 square foot unheated storage building would be constructed to support the kennels and other headquarters-area operations. This new structure would be located approximately 20 feet west of the current structure so it would not be visible from the start of the headquarters driveway. It would include an apron for loading/unloading.
- A two-car garage with separated units would be constructed across the road from the driveway of the Superintendent's Residence (B23). The dumpster in this location would be relocated to the traffic island opposite the other entrance to the Superintendent's Residence.
- A two-car garage with separated units would be constructed next to the eastern panabode (B170).
- For new or replacement landscape fixtures – such as signs, lights, and posts – the National Park Service would use the palette of fixtures recommended in the *Cultural Landscape Report* (NPS 2007a).

Pages 11-16: See attached Figures 2-1, 2-2, 2-3

Pages 11-16: See attached Figures 2-1, 2-2, 2-3

2.2.2 Parking and Circulation

- A new parking loop for the kennels shuttle bus would be installed south of the existing parking location. The loop would be approximately 200 feet long by 24 feet wide with a one-way service road that supports parking for 6 buses. The existing gravel bus parking area would be revegetated.
- The service road entry at the juncture to the main park road would be moved 150 feet west of the current access junction with a level pad at the junction for buses to stop while waiting to turn. Replaced sections of the service road would be revegetated and material recycled as practical. This action and the prior one would allow sled dog demonstration buses to exit out the service road the same way they enter and avoid driving through the core headquarters area.
- The size and shape of the flagpole island would be maintained and preserved as part of the cultural landscape. The drainage from the visitor parking lot across the park road past B110 would be corrected.
- The historic turnaround loop would be re-established at terminus of the main headquarters driveway.
- Electric plug-ins would be added for each existing parking space in the visitor parking lot.
- Excess bituminous paving would be reduced throughout the historic district and native vegetation planted in its place as recommended in the 2007 *Cultural Landscape Report*. Roadside vegetation would be protected by installing limited numbers of boulder barriers.
- A parking area east of the kennels area would be constructed. The parking lot would have 18 spaces rather than the 20 spaces indicated in the 1997 *Entrance Area and Road Corridor DCP*, and would include electric plug-ins.
- The vegetation clearance outlined in the 1997 DCP, denoting vegetation thinning west of the visitor “flagpole” parking lot would be implemented to increase line of sight along the park road.

2.2.3 Maintenance & Utilities

- Buildings in the headquarters area that have heating supplied by the utilidor and steam plant would be converted to individual furnaces fueled initially by propane and later by natural gas if that fuel source becomes available and cost-effective.
- The steam plant (B54) would be decommissioned after all headquarters-area buildings that depend upon it have their own furnaces. The water lab would be moved to the B&U area in C-Camp.
- The leach field would be increased by 0.7 acres to accommodate the added load of C-Camp.
- A sewer line and lift station would be installed from C-Camp to headquarters so that sewage from C-Camp could be piped to the headquarters-area treatment facilities.
- The existing fire hydrant system would be upgraded to meet NFPA 1142, *Standard on Water Supplies for Suburban and Rural Firefighting*.
- Exterior lights would be added in several locations in the district to illuminate pedestrian trails and parking areas. The lights would be responsive to the historic landscape and would meet the intended goals of the 2007 *Cultural Landscape Report*. Where attached to historic buildings they would match the historic fixture or be similar in context. In

parking areas or along walkways, lights would be affixed to poles or bollards. Locations for lights are indicated on Figures 2-2 and 2-3.
- Fiber optic cables would be installed to the "John" House (B112) and kennels building (B105).

2.2.4 Mitigation

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

- Vegetation, Soils and Groundwater: Back slopes and fill slopes would be covered with coarse materials to discourage colonization by invasive plants. Disturbed sites within the project area would be replanted with native vegetation, following the *Interior Alaska Revegetation Plan* (U.S. Geological Survey [USGS] 1994). Revegetation and landscaping would employ native plant species only. Measures to prevent invasive plant colonization would include: pressure washing construction equipment and vehicles prior to entering the park; either obtaining gravel or fill from a weed-free materials site (as verified by a park vegetation technician) or heating to kill any plant material or seeds; and continuing the park's existing exotic plant eradication program. Soil and groundwater remediation of fuel oil contamination would be done to the extent feasible and to the satisfaction of Alaska Department of Environmental Conservation.

- Wetlands: Silt fences and other Best Management Practices (BMP) technologies would be used to protect any adjacent wetlands. As described in the Wetlands Statement of Finding (Appendix A), the mitigation of wetland disturbance by rehabilitating wetlands in another area of the park would be accomplished.

- Wildlife and Habitat: Under the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703), it is illegal to "take" migratory birds, their eggs, feathers or nests. "Take" includes by any means or in any manner, any attempt at hunting, pursuing, wounding, killing, possessing or transporting any migratory bird, nest, egg, or part thereof. The MBTA does not distinguish between intentional and unintentional take. Vegetation clearing, site preparation, or other construction activities that may result in the destruction of active bird nests or nestlings would violate MBTA. In order to avoid violations of the MBTA, bird habitat (vegetation) would not be removed during the nesting season, April 1 through July 15. After completing all the nesting vegetation removal required for the project, there would be no seasonal restriction for construction activities, even during the following nesting seasons. If any active nest were encountered at any time, it would be protected from destruction. "Active" is indicated by intact eggs, live chicks, or presence of an adult on the nest. Eggs, chicks, or adults of wild birds would not be destroyed (Zelenak 2005).

- Night Sky/Natural Lightscape: Selection of outdoor lighting fixtures and technology would involve the expertise of the NPS Night Sky Team or other qualified engineers to assist in minimizing the impact of new outdoor lights on night sky visibility. Principles

that would guide new lighting include: 1) shielding light fixtures (the engineering term is "full cut-off") so that all the light produced by the fixture shines below the horizontal or, alternatively, using very low illumination "guidance" lighting only, 2) using lower illumination levels (particularly important on light colored ground or snow, as a significant amount of light will reflect upward), 3) using narrow spectrum and/or longer wavelength lamps unless full spectrum lamps are necessary or warranted, and 4) dividing areas into several circuits to allow for phased operation and future smart technology implementation such as dual lighting levels, motion sensors, or timers.

- Cultural Resources: New construction would use materials and design elements that are compatible with the character of the buildings in the historic district. New garage entrances in or adjacent to the historic district would not face roadways to minimize visual impact. Landscape features including new exterior lighting would follow the recommendations of the *Cultural Landscape Report*. Project excavations would be monitored by cultural resource staff. If previously unknown cultural resources are located during construction, the project would be stopped in the discovery area until cultural resource staff could determine the significance of the finding and recommend appropriate courses of action.

- Local Communities/Socioeconomic Resources: No mitigation measures were developed for local communities and socioeconomic resources because the project impacts to these resources included small-scale stimuli to the local economy, consistent with historic limits and trends.

- Park Operations and Management: The primary disadvantage identified for park operations in both action alternatives is the increased distance between employee parking areas and offices. Particularly during winter months there is concern for safe walking on icy or snow-covered walkways. Essential mitigation includes shoveling/plowing and sanding walkways prior to the arrival of early morning workers in the headquarters area.

2.3 Alternative 2: Existing Circulation

This alternative presents one integrated solution to meeting the needs in the headquarters area. The actions presented rehabilitate some of the cultural landscape features to the historic period of significance while retaining most of the existing circulation patterns in the historic district, including administrative use along the full length of the service road. The creation of a pedestrian area in the area between the Headquarters building (B21), Communications Center (B141), Overthere (B101), and Cache (B103) would displace employee and administrative parking to expanded lots outside of the core historic district.

In the residential area outside of the historic district, the replacement of the 6-plex apartment building with 3 duplexes would define the location of functions and the development pattern in the residential portion of headquarters. See Figure 2-2. Specific actions are described below.

2.3.1 Buildings and Facilities

- The Communications Center Building (B141) would be replaced with a new administrative facility that has a total footprint of 3,500 square feet. This would be 1,500 square feet smaller than approved in the 1997 *Entrance Area and Road Corridor DCP*.
- A warming hut and SST (600 square feet) would be constructed adjacent to the flagpole parking area. The functions served by the bulletin board, phone booth, and trash receptacle presently in the parking area would be located with this new structure.
- The garage-unit presently used primarily for the park's information technology (IT) staff and storage (B53) would be remodeled and expanded for permanent use by IT. The remodel would include a 225 square foot addition for a new server room and restroom.
- The 6-plex apartment building would be removed and replaced with 3 duplexes with attached two-car garages. Two of the duplexes would be located at the site of the 6-plex and the other would be sited near the existing playground.
- A two-car garage with separated units would be constructed on the bench west of B111, outside the historic district, for use by the residents in housing units B111 and B22.
- The steam plant (B54) would be remodeled for re-use as a meeting space, community center, and work-out room replacing the functions currently located at the Permanent Rec. Hall in the 6-plex apartment building (B51), the work-out facility (B99), and the Superintendents Residence (B23). The playground would be reconstructed adjacent to the steam plant and an outdoor picnic area provided.
- The work-out facility (B99) would be removed once its function is replaced.

2.3.2 Parking and Circulation

- Parking and the bituminous paving would be removed from the area between the headquarters building (B21), the Communications Center building (B141), the Cache (B103), and the interpretive building (B101). The area would become a pedestrian area and landscaped to reflect conditions present during its historic period of significance. Parking would also be removed from in front of the Resources building (B118), but two-way traffic would continue on the service road. Drivable surfaces would be retained to provide emergency access to all structures.
- The parking area west of the Cache (B103) would be expanded to accommodate 22 parking spaces, with electric plug-ins for all the spaces. Access roads would be located on both sides of the expanded parking area and a 10-foot swath of asphalt would be removed between those access roads and along the service road in order to install vegetative buffers between the parking area and the service road.
- The service road from the kennels driveway junction to the Resources Building (B118) would be rebuilt to allow for improved drainage to prevent ponding behind the Cache (B103) and Communications Center (B141). The width of this road would allow for two-lane traffic and the finished wearing surface would be chip seal over a bituminous base course.
- The parking behind B102 and B118 would be expanded and the parking would be moved so that the entrance is at a 45 degree angle from the main headquarters road. There would be 14 parking spaces, all of which would have electric plug-ins. The parking behind B102 that has developed along the main HQ road would be revegetated to re-establish the historic character of the road.

- The parking area between Administration (B123) and the Barn (B106) would be removed and the site would be revegetated.
- A gravel parking area would be added between the eastern panabode (B170) and the duplexes (B252), allowing for 16 parking spaces with electric plug-ins to support residential and administrative parking.
- The parking area behind the steam plant would be landscaped and outfitted to accommodate 4 RV/trailer sites for park volunteers who wish to live out of their own vehicles while working at the park. Sites would include sewer, water, and electric hookups.
- New pedestrian trails would be constructed to link parking lots and administrative buildings, including from the existing visitor parking lot to the new pedestrian area behind the Headquarters building (B21). Trails would be accessible and surfaced with chip-seal material to facilitate snow removal. See Figure 2-2.
- No additional road access is provided to the kennels building.

2.4 Alternative 3: Maximum Rehabilitation – Preferred Alternative

This alternative presents a second integrated solution to meeting needs in the headquarters area. In this alternative, the rehabilitation of cultural landscape to the historic period of significance would take priority over the retention of existing circulation patterns. In addition to removing pavement from the area between the Headquarters building (B21), Communications Center (B141), Overthere (B101), and Cache (B103), pavement would also be removed from the service road in front of the western portion of the Resources building (B118) and continuing on to the kennels driveway. The service road west of the Cache and east of the kennels driveway would be narrowed to a single lane. This alternative would create a nearly continuous pedestrian area from the kennels to the visitor parking lot through the core historic district.

The retention of the 6-plex apartment building leads to an alternate reshuffling of functions in the residential area that includes the Information Technology (IT) staff, storage, and workshop moving to the decommissioned steam plant. A new driveway to serve several trailer pads for park volunteers would be constructed. See Figure 2-3. Specific actions are described below.

2.4.1 Buildings and Facilities

- The Communications Center (B141) building would be replaced with a new administrative facility that has a footprint of 1,500 square feet, which is 3,500 square feet smaller than the building described in the 1997 *Entrance Area and Road Corridor DCP*.
- A SST (400 square feet) would be constructed adjacent to the flag pole parking area and the existing kiosk, phone booth, and trash receptacle. The functions served by the bulletin board, phone booth, and trash receptacle presently in the parking area would be located with this new structure.
- Building 110 (the “Upfront”) would become the winter warming hut for the park.
- B53 (IT office space and residential garages) would be remodeled and expanded by 225 square feet for use as office space and a workout facility, providing temporary offices and storage for IT and eventually replacing and improving the exercise room function

presently located in the "Down Under" (B99). The facility would include a restroom and changing room.

- When the steam plant is decommissioned, it would be remodeled to include IT office and storage space and a training/conference room.
- The workout facility (B99) would be removed after the function is relocated.
- A 600 square foot unheated administrative storage building would be constructed on the gravel pad south of the steam plant.
- The 6-plex apartment building would be renovated, interior and exterior with sound proofing added between units. An accessible entrance to the Permanent Rec Hall would be created at the rear of the building.
- A two-car garage with separated units would be constructed on the bench across from residence B22 for use by the residents in housing units B111 and B22.
- Three two-car garage units with separated units would be constructed behind the 6-plex to provide parking and storage for the residents of the 6-plex.

2.4.2 Parking and Circulation

- Parking and the bituminous paving would be removed from the area between the headquarters building (B21), the Communications Center building (B141), the Cache (B103), the interpretive building (B101), the Resources building (B118), and along the service road to the junction with the kennels driveway. The service road between the Cache and the kennels driveway would be rebuilt as a 10-foot wide, single lane road that would serve primarily as a pedestrian path but would be paved to allow administrative vehicles. The reconstruction would allow for improved drainage to prevent ponding behind the Cache (B103) and Communications Center (B141).The area would become a pedestrian area and landscaped to rehabilitate it to its historic period of significance. Drivable surfaces would be retained to provide emergency and service access to all structures.
- A new parking area measuring 150 feet long by 64 feet wide sufficient for 28 parking spaces would be constructed west of the visitor "flagpole" parking lot, including electric plug-ins for all of the spaces. Access to the new parking area would be from the visitor parking lot via an approximately 60-foot long driveway. The final design for this parking lot would retain a vegetative screen between the parking area and the park road, which would also be a consideration in the vegetation thinning of roadside vegetation identified in section 2.2.2 under Actions Common to All Action Alternatives.
- New pedestrian trails would be constructed to link parking lots and administrative buildings as depicted in Figure 2-3. Trails would be accessible and surfaced with chip-seal material to facilitate snow removal.
- The parking area west of the Cache (B103) would also be removed and revegetated.
- The parking behind B102 and B118 would be expanded and into an L-shaped parking lot allowing for 16 parking spaces with electric plug-ins. In conjunction with this parking area, a vegetative island would be constructed along the HQ road to re-establish the historic character of the road and screen the parking.
- One parking space and pavement would be removed north and west of the Barn (B106) and the bituminous swale would be removed from in front of the Barn (B106) and replaced with a stone rubble-lined swale. The site would be revegetated to re-establish the historic setting.

- The road that leads from upper headquarters, beside the Administration Building (123), down the hill past the "John" house (B112) would be narrowed to a foot path by installing vegetation along the shoulders of the road. The path would still accommodate single lane driving for emergency and maintenance vehicles from the headquarters driveway to the John house, but would be a pedestrian pathway only from the John house downhill to the residential area.
- The pedestrian trail leading from the Administration building (B123) and the Concessions office (B107) would be realigned to lower the grade.
- A spur driveway would be constructed behind the 6-plex beginning east of the steam plant, turning north to pass by the playground and access the existing residential road.
- Along the new spur driveway, 6 pull-in pads for RV's or trailers would be constructed with sewer, water and electric hook-ups. These sites would accommodate RV's or trailers for park volunteers who wish to live out of their own vehicles while working at the park.
- An additional two spaces of paved parking would be added to the east of the IT shop/former garage B53, extending the existing parking area east toward the driveway of residence B34.
- The western viewing stand at the kennels would be pivoted slightly northward to allow restoration of the access drive behind the bleachers. This driveway would become the principal vehicle access to the kennels during winter months.

2.5 Description of Alternatives and Actions Considered But Eliminated from Detailed Study

2.5.1 Dog sled demonstration bus parking. Two additional alternatives were considered for the dog sled demonstration bus parking and turnaround. One of these alternatives would create a pull-through driveway that buses would enter at the service road junction with the park road and exit through the visitor parking lot with parallel parking along its lower length. This action was eliminated because it would move bus parking too far from the sled dog demonstration for many visitors to walk, and because it would cause far greater disturbance, including wetlands disturbance, than other alternatives. A second option would have the bus turnaround loop circling north from the service road instead of south, but that alternative had no evident advantages over the southern option and would also move parking further away for visitors.

2.5.2 Employee parking behind the Communications Center/new administrative building. This proposal would have placed a new employee parking lot behind the new administrative building slated to replace the structure that presently houses the park's Communications Center and library (B141). This lot would have been built instead of the expansion of the existing lot behind the Cache (Alternative 2) or the new lot west of the visitor parking lot (Alternative 3). This lot would have required more ground disturbance than expanding the lot behind the Cache while otherwise sharing that lot's advantages and disadvantages. It would detract from the character of the core historic district and would have required more ground disturbance for driveway access than the proposed lot west of the visitor parking lot.

2.5.3 Uphill location for residential garage serving B111 and B22. It was suggested that impacts on the character of the Headquarters Historic District could be avoided by placing this garage

outside of the historic district boundary on the hillside above the residences with access from the maintenance access road. However, the slopes in this area would have required extensive cut and fill, and the moving of a vehicular use closer to the park's air quality monitoring site at the top of the road could adversely effect future measurements and the integrity of a multi-decadal data set collected at this point.

2.5.4 Package treatment plant. The 1997 *Entrance Area and Road Corridor DCP* called for installation of a package treatment plant near the steam plant to process waste from the headquarters and C-Camp developments. However, value analysis demonstrated that this alternative would not be cost effective for the benefits achieved. As a result, the installation of a package treatment plant has been dropped from this plan.

2.5.5 Realignment of park road at headquarters driveway junction. A concern was identified during scoping regarding the sight distance for west-bound vehicles turning from the park road onto the main headquarters driveway, where it is possible to begin the turn with limited visibility of traffic in the east-bound lane. Proposed solutions included cutting back the hillside on the north side for greater visibility or realigning the road slightly to the south. The recommendation from staff at the Federal Highway Administration was to wait on decisions about road realignments because solutions would be somewhat dependent on a later project design for the Rock Creek Bridge replacement. No accidents have been reported at this junction for at least the past twelve years, and the thinning of roadside vegetation west of the visitor parking lot proposed in all action alternatives would help improve sight distance in this area.

2.5.6 Facility site on Native land. ANILCA section 1306 calls for the location of administrative sites and visitor facilities on Native lands in the vicinity of conservation system units "to the extent practicable and desirable." The needs for new or replacement facilities in this plan are exclusive to supporting existing functions in the headquarters area and require geographic proximity to those functions in order to meet the needs. For that reason, siting facilities outside of the headquarters area is not practicable.

2.6 Environmentally Preferred Alternative

The environmentally preferred alternative is the alternative that will promote the national environmental policy expressed in NEPA Section 101(b). The environmentally preferred alternative means the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources.

Alternative 1, No Action, is the environmentally preferred alternative because it would have the least environmental impact. The developed area would not expand under the No Action, compared to 2.4 and 2.5 acres of expansion under the action alternatives. Expansion of the developed area under the action alternatives would impact vegetation, soils, wetlands, and wildlife habitat and natural lightscape resources. However, it is important to note that alternatives 2 and 3 would better preserve and enhance historic resources, most substantially in alternative 3.

Table 2-1: Summary of Alternatives

Topic	Alternative 1 No Action	Alternative 2 Existing Circulation	Alternative 3 - Preferred Maximum Rehabilitation
Buildings/Facilities			
Historic structures	No additional historic structures rehabilitated.	Un-renovated historic and non-historic buildings in the headquarters area rehabilitated.	Un-renovated historic and non-historic buildings in the headquarters area rehabilitated.
B141 (Comm Center/library)	Existing building remains	B141 removed and replaced by 3,500 sq. ft. footprint administrative building	B141 removed and replaced by 1,500 sq. ft. footprint administrative building
Administrative Storage	Pipe storage racks and existing shed remain in place	Pipe storage and shed removed. 800 sq. ft. unheated storage building constructed 20 ft. west of existing shed for kennels and other HQ ops.	Pipe storage and shed removed. 800 sq. ft. unheated storage building constructed 20 ft. west of existing shed for kennels and other HQ ops. 600 sq. ft. unheated storage building constructed on pad south of the steam plant (B54).
B51 (6-plex apartment building)	B51 remains as is.	B51 removed and replaced by 3 duplexes.	B51 is renovated.
B53 (IT/residential garages)	IT remains in this structure at existing footprint.	B53 expanded by 225 sq. ft. for server room and bathroom; IT remains here.	B53 expanded by 225 sq. ft. and renovated to provide bathroom, temporary IT offices and storage, and eventual workout facility.
B54 (steam plant)	B54 remains as the steam plant.	B54 renovated as community center and workout facility.	B54 is renovated for IT office, workspace, and storage and a meeting/ training room.
B99 (work-out facility)	B99 is retained as is.	B99 is removed after function is relocated.	B99 is removed after function is relocated.
Residential parking garages	No new residential garages constructed.	3 new two-car garages constructed. The one associated with B22 and B111 located outside the historic district.	6 new two-car garages are constructed. The one associated with B22 and B111 located inside the historic district.
Visitor warming hut and SST	No warming hut or SST constructed.	A warming hut/SST constructed adjacent to the visitor parking lot.	A SST is constructed adjacent to the visitor parking lot. B110 (Upfront) is used as a warming hut.
Fixtures	No palette of non-historical fixtures adopted for use in historic district.	A palette of non-historic fixtures, signs, and other landscape elements utilized in historic district as recommended by 2007 *Cultural Landscape Report*.	A palette of non-historic fixtures, signs, and other landscape elements utilized in historic district as recommended by 2007 *Cultural Landscape Report*.

Table 2-1: Summary of Alternatives continued....

Topic	Alternative 1 No Action	Alternative 2 Existing Circulation	Alternative 3 - Preferred Maximum Rehabilitation
Parking and Circulation			
Parking in core headquarters area	Parking retained in the core headquarters area.	Parking removed between buildings B21, B101, B103, and B141, and from in front of B118. This area landscaped. Parking between B106 (Barn) and B123 (Administration) removed and revegetated. Drivable surfaces enable service and emergency vehicle access to buildings.	Parking is removed in the area between buildings B21, B101, B103, B141, and B118. This area landscaped. Parking removed from behind the Cache (B103) and area revegetated. Drivable surfaces enable service and emergency vehicle access to buildings.
Service road	Two-way traffic continues along the service road.	Two-way traffic continues along the service road. Road rebuilt from the kennels road junction to B118 to improve surface drainage.	The service road is narrowed and incorporated into the pedestrian area from the kennels road junction to the eastern end of B118. It is rebuilt from the kennels road junction to B118 to improve surface drainage.
New & replacement administrative parking	No new parking constructed.	The parking lot behind B103 (Cache) increased to 22 spaces. Parking behind B102 reconfigured and increased to 14 spaces. New 18-space parking lot constructed on pad east of kennels.	New 28-space parking lot constructed west of visitor parking lot. Parking behind B102 reconfigured and increased to 16 spaces. New 18-space parking lot constructed on pad east of kennels.
Sled dog demonstration bus parking	Buses continue to park at existing gravel parking area.	New bus loop and parking constructed to allow buses to exit service road the same way they enter. Gravel parking area revegetated.	New bus loop and parking constructed to allow buses to exit service road the same way they enter. Gravel parking area revegetated.
Service road/park road junction	The service road remains on existing alignment.	Service road junction shifted 150 feet west and grade reduced at junction for buses waiting to turn.	Service road junction shifted 150 feet west and grade reduced at junction for buses waiting to turn.
Historic turnaround loop	The turnaround loop at the end of the headquarters driveway is not reestablished.	Turnaround loop reestablished.	Turnaround loop reestablished.
"John House" road	The road by B112 remains accessible to vehicle traffic.	The road by B112 remains accessible to vehicle traffic.	The road by B112 narrowed for pedestrian access only, with service and emergency vehicle access from the main headquarters driveway only.

Table 2-1: Summary of Alternatives continued....

Topic	Alternative 1 No Action	Alternative 2 Existing Circulation	Alternative 3 - Preferred Maximum Rehabilitation
Kennels building access	No additional road access is provided to the kennels building.	No additional road access is provided to the kennels building.	Westernmost kennels viewing stand rotated to allow reestablishment of back road entrance to the kennels building.
VIP RV/trailer parking	No VIP RV/trailer parking provided in the headquarters area.	4 VIP RV/trailer pads provided on pad behind the steam plant.	6 VIP RV/trailer pads provided along new spur road east of B51 (6-plex apartment).
Residential area parking	No new residential area parking provided.	A 16-space gravel parking area constructed between the B170 (panabode) and B252 (duplexes).	2 spaces of paved parking added to lot east of B53 (present IT offices).
Pedestrian trails	No trails constructed or realigned.	New pedestrian trails constructed to link parking lots and administrative facilities.	New pedestrian trails constructed to link parking lots and administrative facilities. The trail from B123 (Administration) to B107 (Concessions) realigned to lower grade.
Sight Distance	No thinning of vegetation to improve sight distance at HQ driveway/visitor parking	Vegetation thinning west of visitor parking lot to increase sight distance.	Vegetation thinning west of visitor parking lot to increase sight distance.
Road/Parking Definition	No removal of excess bituminous paving.	Excess bituminous paving removed throughout the historic district with revegetation. Limited use of boulder barriers to protect vegetation.	Excess bituminous paving removed throughout the historic district with revegetation. Limited use of boulder barriers to protect vegetation.
Maintenance and Utilities			
Steam plant – utilidor	The steam plant/utilidor remains as heating infra-structure backbone for HQ.	Steam plant decommissioned and heat source replaced by individual furnaces.	Steam plant decommissioned and heat source replaced by individual furnaces.
Leach field	Leach field remains at existing size.	Leach field expanded by 0.7 acres.	Leach field expanded by 0.7 acres.
C-Camp sewage	Disposal of C-Camp sewage continues to rely on C-Camp septic tank/leach field system.	Sewer line and lift station installed to pipe C-Camp sewage to expanded HQ leach field.	Sewer line and lift station installed to pipe C-Camp sewage to expanded HQ leach field.
Exterior lighting	No additional exterior lights added.	Exterior lights added to illuminate pedestrian trails and parking areas.	Exterior lights added to illuminate pedestrian trails and parking areas.
Fire hydrants	No upgrades to the existing fire hydrant system.	Hydrant system upgraded to meet NFPA 1142 standard.	Hydrant system upgraded to meet NFPA 1142 standard.
Fiber optic cable	No additional fiber optic cable would be installed.	Fiber optic cable would be installed to the John House (B112) and Kennels (B105)	Fiber optic cable would be installed to the John House (B112) and Kennels (B105)

Table 2-2: Summary of Environmental Consequences

Topic	Alternative 1 No Action	Alternative 2 Existing Circulation	Alternative 3 - Preferred Maximum Rehabilitation
Air Quality	There would be no additional adverse impacts to air quality, although there would be continuing minor adverse impacts from other construction activities in the entrance area.	The increase in construction activity would contribute to minor adverse impacts to air quality associated with implementation of the *Entrance Area and Road Corridor DCP*.	The increase in construction activity would contribute to minor adverse impacts to air quality associated with implementation of the *Entrance Area and Road Corridor DCP*.
Vegetation, Soils, and Wetlands	There would be no additional impacts to vegetation, soils, or wetlands in the headquarters or entrance areas of the park.	The long-term, noticeable, although localized adverse impacts to vegetation, soils, and wetlands would be moderate.	The long-term, noticeable, although localized adverse impacts to vegetation, soils, and wetlands would be moderate.
Wildlife and Habitat	There would be no additional effects on wildlife habitat, although cumulative moderate adverse effects remain from other developments in the park entrance area.	There would be moderate adverse impacts to wildlife and wildlife habitat.	There would be moderate adverse impacts to wildlife and wildlife habitat.
Cultural Resources	There would be no additional impact on cultural resources, and a moderate benefit would remain from previous actions	There would be moderate benefits to the cultural resources of the park because of long-term, noticeable enhancements to one of Denali's most important cultural resources.	There would be major benefits to the cultural resources of the park because of long-term, substantial enhancements to one of Denali's most important cultural resources
Night Sky/Natural Lightscape	There would be no additional impact on night sky visibility, which will remain moderately impacted from exterior lighting elsewhere in the area.	The addition of outdoor lighting as part of the headquarters area plan would result in minor adverse impacts to night sky visibility in the Denali entrance area.	The addition of outdoor lighting as part of the headquarters area plan would result in minor adverse impacts to night sky visibility in the Denali entrance area.
Visitor Use and Recreation	There would be no additional impact on visitor use and recreation; prior major benefits remain.	The actions proposed would provide moderate beneficial impacts to visitor use and recreational opportunities	The actions proposed would provide moderate beneficial impacts to visitor use and recreational opportunities.
Local Communities and Economy	There would be no additional impacts to local communities or economies which have received moderate benefits from prior frontcountry projects.	There would be minor benefits to the local and regional community and economy as a result of federal expenditures improving park facilities.	There would be minor benefits for the local and regional community and economy as a result of federal expenditures improving park facilities.
Park Management and Operations	There would be no additional impacts on park management and operations, which have seen major benefits from improvements in the headquarters area.	There would be some very minor adverse impacts to employees from changes in parking and circulation, but overall there would be moderate beneficial impacts.	Although there would be some minor adverse impacts to employees from changes in parking and circulation, overall there would be moderate beneficial impacts.

3.0 AFFECTED ENVIRONMENT

3.1 Project Area

Denali National Park and Preserve encompasses 9,419 square miles in central Alaska, with the main entrance along the George Parks Highway approximately 240 miles north of Anchorage and 12 miles south of Healy. The project area lies near mile post (MP) 3.0 of the 92-mile long Park Road. See Figure 3-1.

3.2 Air Quality

Denali National Park and Preserve is designated a class I area under the Clean Air Act. Air quality in Denali is generally exceptional, and there have been no documented exceedances of the National Ambient Air Quality Standards. The park is managed to achieve the highest attainable air quality levels and visibility standards consistent with the applicable Clean Air Act designations and mandates specified by the Alaska National Interest Lands Conservation Act and the NPS Organic Act. A nationally important, multi-decadal air quality monitoring station is located just outside of the project area on the hill above residences B111 and B22. The station measures ambient air quality and wet deposition of contaminants through several nationwide monitoring networks, and was established to track regional conditions with minimal local influence.

3.3 Vegetation, Soils and Wetlands

3.2.1 Soils

Soils within the project area vary according to parent material, topography and vegetation coverage, and generally consist of three types. Sandy and silty soils underlay forested areas, and support moss and lichen groundcover. Wetland soils consist mostly of poorly-drained silts and glacial moraine materials, and typically possess a subsurface accumulation of organic matter and peat layers, with permafrost occasionally at depths less than 3 feet (NPS 1997). Permafrost has not been studied in the project area but can be continuous at higher elevations north of the Alaska Range (NPS 2004).

3.2.2. Vegetation

The park as a whole is comprised of a mosaic of tundra, forest, shrubland and open meadow. The project area, located at an elevation of approximately 2,000 ft, lies within the northern boreal forest biome (taiga).

The taiga immediately surrounding headquarters consists mostly of mixed needle leaf/deciduous forest of white and black spruce (*Picea glauca and P. mariana*) mixed with paper birch (*Betula papyrifera*) and some aspen (*Populus tremuloides*). White spruce occupy areas of well-drained soil, while black spruce are usually found in areas with poor drainage underlain by shallow permafrost. Common tall shrubs in this spruce-paper birch forest include alder (*Alnus crispa*), dwarf birch (*B. glandulosa*), and willows (including *Salix bebbiana, S. arbusculoides, S. glauca,* and *S. planifolia spp. pulchra*). The understory includes, prickly rose (*Rosa acicularis*), shrubby

cinquefoil (*Potentilla fruiticosa*), Labrador tea (*Ledum groenlandium, L. palustre*), bog blueberry (*Vaccinium uliginosum*), and high-bush cranberry (*Viburnum edule*). Ground cover typically consists of lichens mosses including thin feather mosses (*Hylocomium* spp.) (Viereck et al. 1992, NPS 1997, NPS 2005a).

3.2.3 Wetlands

Wetlands are transitional areas between terrestrial and aquatic systems, where the water table is usually at or near the surface or the land is covered by shallow water (NPS 2003a). The project area wetlands are classified as Palustrine Forested, Needle-leaved Evergreen, saturated wetlands (PF04B) under the "Classification of Wetlands and Deepwater Habitats of the United States," the Cowardin Classification System (Cowardin et al. 1979), and are therefore subject to NPS wetlands compliance procedures.

The wetlands under the proposed bus loop road and parking are characterized by poor drainage, stunted white spruce, a thick feather moss cover with significant patches of sphagnum moss, and scattered diamond-leaf willow. A thick colluvium has built up on the slope leading down to the glacially-cut bench edge just behind the dog kennels and this soil generally has a high-enough clay content to retard oxygen circulation and, when combined with the thick moss cover, keeps the root layer cold late into the growing season.

The wetlands under the proposed employee parking lot west of the flagpole are right at the edge of the uplands along the edge of the Rock Creek bench and have fairly thin soils, but are covered with a variety of wetland willow species as well as having a few small seeps, with remanent tussocks creating pockets of hummocky terrain from which grow stunted spruce. Vegetation in the rest of the forested wetlands is typically dominated by white spruce stunted by the nutrient conditions related to the cold soils (Viereck et al. 1992). The understory shrub layer consists of both low and tall shrubs of willow (*Salix* spp.) diamond leaf willow (*Salix planifolia*), Labrador tea (*Ledum* spp.) and bog blueberry (*Vaccinium uliginosum*). Common ground cover includes feather and sphagnum mosses (*Sphagnum* spp.), leaf lichens, lowbush cranberry (*Vaccinium vitis-idaea*), crowberry (*Empetrum nigrum*) and a variety of forbs (Viereck et al. 1992).

These wetlands function to attenuate snow melt surface flow during break-up and discharge during heavy rain events. These wetlands also provide habitat for small mammals, such as red squirrels, snowshoe hares, and porcupine; bird species, including gray jays, robins, thrushes, sparrows, and warblers. Moose frequent the area for forage, and it is considered potential moose calving area.

Wetland boundaries are depicted on Figure A-1 in Appendix A.

3.4 Wildlife Habitat

3.3.1 Mammals

Large mammal species such as moose (*Alces alces*), caribou (*Rangifer tarandus*), Dall sheep (*Ovis dalli*), brown bear (*Ursus arctos*), black bear (*Ursus americanus*), and gray wolf (*Canis lupus*) are found to the west of the project area, and are frequently seen along the park road or in the surrounding hillsides and mountains. Within the project area, moose would likely browse in

the wetlands and black and brown bears might forage in the upland forested areas around the headquarters area. Wolves are generally found wherever prey species, such as moose, are present, and therefore may also be found in the area.

Smaller mammals present within the project area include red fox (*Vulpes vulpes*), snowshoe hare (*Lepus americanus*), ermine (*Mustela erminea*), and red squirrel (*Tamiasciurus hudsonicus*) (NPS 2005a). Red fox are common and very visible along the Park Road whereas snowshoe hares and red squirrels are commonly found in forested areas. Other small mammal species include shrews (*Sorex* spp.), several species of voles, and lemmings.

3.3.2 Birds

The resident bird species common to the project area include spruce grouse (*Dendragapus canadensis*), willow ptarmigan (*Lagopus lagopus*), common raven (*Corvus corax*), black-billed magpie (*Pica pica*), boreal chickadees (*Poecile hudsonica*), common redpolls (*Carduelis flammea*), and three-toed woodpeckers (*Picoides tridactylus*). The great-horned owl (*Bubo virginanus*) and boreal owls (*Aegolius funereus*) are the most common resident owl species in Denali, while great gray owls (*Strix nebulosa*), and the northern hawk owls (*Surnia ulula*) occur at very low densities (NPS 2005b).

The numerous migratory species found in the project area include ruby-crowned kinglets (*Regulus calendula*), sparrows (American tree sparrow [*Spizella arborea*], savannah sparrow [*Passerculus sandwichensis*], fox sparrow [*Passerella iliaca*], white-crowned sparrow [*Zonotrichia leucophrys*]), warblers (yellow-rumped warbler [*Dendroica coronata*] and orange-crowned warbler [*Vermivora celata*], Wilson's warbler [*Wilsonia pusilla*]), violet green swallow (*Tachycineta thalassina*), dark-eyed junco (*Junco hyemalis*), American robin (*Turdus migratorius*), and several species of thrush (*Catharus* spp.) (NPS 2005b). Other common migrants include northern harrier (*Circus cyaneus*), mew gull (*Larus canus*), and golden eagle (*Aquila chrysaetos*). Wetland-nesting shorebirds include lesser yellowlegs (*Tringa flavipes*), common snipe (*Gallinago gallinago*), solitary sandpiper (*T. solitaria*), and wandering tattler (*Heteroscelus incanus*) (NPS 2005b).

Although currently no bird species listed as threatened or endangered occur in Denali, one federal species of concern, the olive-sided flycatcher (*Contopus cooperi*), is found within the general project area. This bird nests in open coniferous forests with bog ponds and marshy streams, and in woodland/dwarf forests (NPS 2005b).

The State of Alaska maintains a list of "species of special concern." Species on this list that occur within the park boundaries include the American peregrine falcon (*Falco perigrinus anatum*), olive-sided flycatcher, gray-cheeked thrush (*Catharus minimus*), and blackpoll warbler (*Dendroica striata*). All of these species are found in suitable habitats, although little is known about population abundance or distribution.

3.5 Cultural Resources

The 11.91-acre Headquarters Historic District encompasses 18 buildings and a network of narrow connecting roads. In keeping with the National Park Service philosophy of rustic

architecture; the physical features of the majority of buildings in the District reflect a conscious attempt to harmonize with their natural surroundings through the use of building materials and techniques indigenous to interior Alaska and through sensitive siting. Horizontal log (or log veneer), vertical log plank; board and batten, and clapboard siding are used predominantly on exterior walls. Logs or rough sawn lumber; characteristically exposed under the eaves or at the ends of gable roofs; serve to emphasize the rustic qualities of buildings. The contributing buildings in the District were erected between 1926 and 1941. Fourteen buildings maintain significant exterior integrity and contribute to the ambience of the District. Four buildings are considered noncontributing structures due to their recent construction; loss of physical integrity; and/or their non-rustic architectural features, including B118 (Resource Management), B123 (Administration), B217 (Garage), and B251 (residence) (NPS 1985).

The historic buildings in the district are used for both administrative and residential purposes. The park kennels building hosts a program interpreting the history and current use of sled dog patrols in the park. The boundaries of the historic district are depicted on Figure 3-1.

The Headquarters District is historically significant since it illustrates the presence and early growth of the National Park Service in the State of Alaska. The National Park Service was established for the stated purpose of conserving areas of outstanding national beauty and wildlife and for providing outdoor recreational opportunities to the American public. The Civilian Conservation Corps (CCC), a Depression-era program whose life extended from 1933 to 1942, contributed greatly to the expansion and development of the Headquarters Historic District in the late l930s. Throughout the nation and locally at Mount McKinley National Park; the CCC facilitated and enhanced the efforts of the National Park Service. The Headquarters Historic District represents the two historical themes of conservation and recreation (NPS 1985).

All but four (B21, B22, B110, B111) of the contributing structures in the Headquarters Historic District have been rehabilitated since the completion of the 1997 *Entrance Area and Road Corridor DCP*. Several still require some interior work.

In addition to the structures within the historic district, there are four residential homes just outside the district designed by NPS architect Cecil Doty that were constructed during the post-World War II, pre-Mission 66 period when the federal government was reinvesting in parks. The 1-story ranch style homes are significant for three reasons. First, they are emblematic of the revitalization and modernization of the national parks following World War II. Second, they were designed by Cecil Doty who was one of the most influential post-World War II architects in the National Park Service and whose work defined the Mission 66 style, particularly for visitor centers. Finally, the houses represent the transition between the rustic and modern style of national park architecture and contain elements of both. NPS cultural resources staff are presently preparing a nomination to add these houses to the National Register of Historic Places. All of the houses have had some modifications since original construction, and two have been completely remodeled and no longer have their original floor plans (NPS 2007b).

3.6 Night Sky/Natural Lightscape

The primary visual resource of concern is the park's night sky visibility, or "natural lightscape."

Night sky visibility is an important part of the scenic resources that national parks protect, and one that is increasingly endangered throughout the United States because of exterior lighting associated with buildings, parking lots, and industry. There has been no inventory completed that describes the status of Denali's natural lightscape, however the absence of nearby urban centers and the park's remoteness mean that Denali generally has outstanding opportunities for night sky viewing. In the immediate area near park headquarters, businesses in Nenana Canyon use outdoor lighting and the Alaska Department of Transportation and Public Facilities has light poles on the divided portion of the Parks Highway, although typically most of these light sources are turned off during the dark winter months so only the late summer visitation season is impacted.

3.7 Visitor Use and Recreation

Approximately 400,000 people visit the park annually, primarily between mid-May and mid-September (NPS 2007c). The primary visitor activity at Denali is a shuttle or tour bus ride along the Denali park road, which stretches from the Parks Highway for 90 miles into the park interior, ending at Kantishna. Annually, almost 300,000 visitors embark upon a shuttle bus trip or tour beyond the Savage River checkpoint for travel into the park interior (NPS 2004). The remaining visitors stay in the frontcountry and explore this area of the park via the Savage River Shuttle bus, tour bus, private car, bicycle, or on foot. Several thousand visitors are also recorded on the south side of the Alaska Range at the Talkeetna Ranger Station and on concession-operated scenic air tours that land on park glaciers. All types of visitation to the park of are expected to continue to increase over the next 10-15 years.

Within the project area, most visitor use occurs at the sled dog kennels. The only working sled dog kennel in the National Park Service is found at Denali, and rangers provide 30-45 minute demonstration programs at the historic kennels building three times a day during peak season. It is the most popular interpretive program at the park, hosting approximately 35,000 visitors annually. Almost all visitors to the sled dog demonstrations ride a designated concession bus to the program which boards at the Denali Visitor Center approximately ½ hour before the presentation. Up to 6 buses may carry passengers to a single sled dog demonstration. The buses drive past the main headquarters driveway to the service road junction, turn, and drive down the service road to unload prior to the demonstration. The present parking and unloading area does not meet accessibility standards. The buses remain parked while visitors are at the demonstration, and then travel through the core of the historic district and exit along the main driveway. Visitors also walk to demonstrations along the Roadside and Rock Creek Trails or use the Savage River Shuttle. Although it is discouraged, a few visitors drive private vehicles, park in the limited visitor parking at the headquarters visitor parking lot, and walk a short trail to the kennels.

Few visitors tour the rest of the Headquarters Historic District. Although a few walk through on their way between the visitor parking lot and the kennels, there are currently no interpretive exhibits, brochures, or other information to identify or explain the significance of the district.

The Rock Creek and Roadside Trails are also used by visitors who simply wish to take a hike and do not necessarily attend a sled dog demonstration, but who may end up in the headquarters

area. The Savage River Shuttle and sled dog demonstration buses also allow visitors to walk one direction between the visitor center and headquarters and take a bus the other direction.

During winter, the park road is closed just west of the visitor parking lot and the driveway that provides access to residences #111 and #22. Visitors leave cars in this parking lot while on day or overnight ski, snowshoe, or dog mushing trips that start along the park road corridor. The Spring Trail near the kennels is also available for starting trips, and is the principal route used by visitors after road plowing begins in March. Dog mushers are allowed to unload vehicles on the service road by the starting point of the trail. Tie-off posts are provided.

3.8 Local Communities and Local Economy

The Denali Borough has a diverse economy for a rural community. Major sources of employment include Clear Air Force Station near Anderson, the Usibelli Coal Mine and an associated Golden Valley Electric Association (GVEA) coal-fired power plant in Healy, Denali National Park and Preserve, and tourism businesses that depend upon visitation to the national park. While all four are substantial contributors to the local economy, the tourism industry is the driving force behind employment growth in the borough. Hotels, restaurants, transport services, retail shops, gas stations, and guide services are among the many services available for people coming to visit the national park. To illustrate the growth, in 1980 the National Park Service counted just 133 hotel rooms near the park's entrance. By 2004, there were 1,900 rooms, 346 cabins, and 587 RV spaces, excluding campsites and RV sites within the park (Denali Borough, pers. comm.). Half of the top 10 employers in the borough in 2000 were in the tourism industry.

Employment in the Denali Borough is strongly seasonal because of the importance of the tourism industry within the borough's economy compared to the other industries. By conservative estimates, the population of the area at least triples during the summer season, which is roughly mid-May to mid-September (Fried and Windisch-Cole 2001). The fluctuation in the jobless rate is one indicator of this seasonality; in 2000 the rate peaked at 17.7% in January and then declined to just 3.1% in July. Even more telling is workforce residency. In 1999, 39 percent of the private sector wage and salary workforce in the borough were nonresidents of the state. Another 42 percent resided somewhere else in Alaska. That means that during the summer, non-resident private-sector workers outnumber the local workers 4 to 1. (Fried and Windisch-Cole 2001) One entire community in the borough – the Nenana Canyon business area just outside the park boundary along the Parks Highway – is inhabited by thousands of employees and visitors any given night of the summer, but is unpopulated from October through April, the businesses boarded up for the winter.

Despite the seasonality of tourism, its impact is felt year-round in two ways. First, many local residents work in tourism during the summer, but spend their earnings throughout the year. Second, the borough government depends on bed taxes for approximately 86% of its revenue, much of which is used to fund the borough school district (Fried and Windisch-Cole 2001). For the latter reason, communities throughout the borough are strongly concerned about national park visitation even if they do not benefit directly from tourism and other park-related employment.

Pages 35-36: See attached Figure 3-1.

Pages 35-36: See attached Figure 3-1.

3.9 Park Management and Operations

The headquarters area is the administrative hub for Denali National Park and Preserve. The superintendent and principle personnel in concessions management, interpretation, communications, law enforcement/emergency medical services, information technology, administration, and research and resource management all have offices in the headquarters area, primarily within the historic district. Some functions, particularly communications, law enforcement/emergency medical services, and fire management are slated to move to a new facility in the C-Camp area although the timing and scope of that project are presently being reviewed in light of information developed since completion of the *C-Camp Improvements Environmental Assessment* (NPS 2006).

In addition to the staff and their offices, the headquarters area hosts several other functions including the park resource and interpretive libraries, the park's museum collection, central files, the computer network and phone hubs, and both temporary and permanent storage. Six of the structures inside the historic district and most of the structures outside of the historic district are residential housing. There are a total of 24 housing units in the headquarters area, occupied primarily by permanent employees. Some are used for transient or temporary housing. There are over 30 full-time residents, including several children. A playground is located to the east of the six-plex apartment building (B51). In the basement of building #51 is the "Permanent Rec Hall," which has been used as a gathering place, exercise room, and entertainment area for residents in permanent housing but is also used as a conference room for administrative purposes.

Non-residential functions outside of the historic area include the "Down Under" (building #99) which serves as a workout room; building #53 – a former 6-bay garage – which primarily hosts the storage, offices, and computer network hub for the information technology (IT) team; one of the panabodes (building #169) which serves as an office for a portion of the resource management staff; and the steam plant (building 54) which provides heat through an underground utilidor to warm many of the headquarters area buildings. The utilidor also holds water and sewer pipes and electrical service lines. The utilidor is inefficient as a means of providing heat, and all buildings are gradually being converted to individual propane-fueled furnaces. When and if all buildings are converted, the steam plant will become obsolete, although the utilidor will still be necessary for holding water pipes and other utility infrastructure.

Along the road running east of the kennels building are a variety of storage buildings including a pipe rack and a long shed used for sheltering a variety of equipment and materials, the latter of which is inside the historic district boundary. At the end of the road are three conex containers being utilized for storage by law enforcement/emergency medical services, resource management, and fire management. This is also the location of a compost pile used to dispose of waste from the park's sled dogs. The park's National Weather Service weather station is also located here. This historically significant station has been in continuous operation at its current site since 1925 and has recorded one of the lengthiest sets of weather data for the state of Alaska.

To the north of the project area, the driveway that provides access to residences #111 and #22 goes further uphill to end in an administrative area that supports the headquarters water system.

An air quality research site and a research snow course are also located here. The air quality site has provided 28 years of uninterrupted data through national monitoring networks. Parameters measured at the headquarters station include atmospheric deposition, ground-level ozone, sulfur and nitrogen oxides, fine particles and aerosols, and associated meteorological parameters.

The maintenance division uses additional formerly residential garage bays for storage in building #217, and some residential storage still occurs in building #53. The gravel pad south of the steam plant is presently used for several small, temporary storage buildings and a temporary office trailer. Also south of the steam plant is the leach field for the headquarters area.

The main headquarters road starting by the flagpole and visitor parking lot served as the primary entry point to the headquarters area historically and continues to serve as the primary entry point for administrative traffic today. Most residential traffic enters on the driveway to the northeast. The service road to the west primarily serves west-bound administrative traffic and access to the parking area west of the Cache (building #103) and to the kennels. Sled dog demonstration buses also enter the headquarters area along this road. In winter when the park road is closed at the headquarters gate, some winter maintenance continues out to mile 7 of the road to minimize ice build-up on the road surface, during which time road equipment also uses the service road.

Employee parking is generally around the administrative buildings where the employees work, with some more remote parking along the traffic island in the residential area near the Superintendent's house (building #23). Residential parking is generally at the residences, with six-plex apartments having designated parking spaces along the surrounding roadways. The gravel pad to the east of the steam plant (building #54) was expanded to provide space specifically for storage of employee recreational vehicles in 2001 (NPS 2001b). An existing environmental assessment provides for the deepening of parking spaces to the west of and across the street from building #51 to accommodate longer vehicles (NPS 2001b).

There are several areas critical as snow dumps to store snow removed from headquarters roads. These are marked on Figure 3-1.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Introduction

This section provides an evaluation of the impacts or potential impacts of each of the alternatives on the resources described in the issue statements presented in Section 1, Purpose and Need.

4.2 Methodology

4.2.1 Impact Criteria and Assessment

The impact analysis was conducted in a consistent manner based on standardized impact definitions. For each issue selected for detailed analysis (see Section 1.4) direct, indirect, and cumulative impacts have been described. Impacts identified for each issue are based on the duration, extent, and intensity of the impact. Summary impact levels (characterized as negligible, minor, moderate, or major) are given for each impact topic (issue). Impact level thresholds are defined in Table 4-1.

The proposed development areas are shown conceptually on Figures 2-2, and 2-3 for the action alternatives. As the designs for the facilities are finalized, the actual area of disturbance may be less, depending on how the new pads or buildings are designed to fit within the conceptual area. The area of potential effect of the proposed actions was calculated for each alternative using the conceptual areas. Therefore, the area of potential effect is the entire conceptual area, while the actual footprint would likely be less.

Table 4-1 Resource Assessment Impact Levels

Impact Level	Negligible	Minor	Moderate	Major
Intensity	Little or no impact to the resource would occur; any change that might occur may be perceptible but difficult to measure.	Change in a resource would occur, but no substantial resource impact would result; The change in the resource would be perceptible but would not alter the condition of the resource.	Noticeable change in a resource would occur and this change would alter the condition or appearance of the resource, but the integrity of the resource would remain.	Substantial impact or change in a resource area would occur that is easily defined and highly noticeable, and that measurably alters the condition or appearance of the resource.
Extent	None	Localized – Impact would occur only at alternative site or its immediate surroundings, and would not extend into the region.	Wide Area of Park – Impact would affect the resource on a regional level or in the park as a whole, extending well beyond the immediate alternative site.	Park-wide – Impact would affect the resource on a national level, extending well beyond the region or park as a whole.
Duration	None	Temporary – Impact would occur only during construction. After construction, the resource conditions would return to pre-construction conditions.	Short-term – Impact would extend beyond the time of construction, but would not last more than two years.	Long-term – Impact would likely last more than two years and may continue beyond the lifetime of the project.

4.2.2 Cumulative Impacts

As defined in 40 CFR 1508.7, cumulative impacts are the incremental impacts on the environment resulting from adding the proposed action to other past, present, and reasonably foreseeable future actions. Cumulative impacts were assessed by combining the potential environmental impacts of the alternatives with the impacts of projects that have occurred in the past, are currently occurring, or are proposed in the future within the entrance area. In the past, these cumulative impacts have mainly been due to increased visitor use along the park road, and development and improvement of administrative and visitor services in the entrance area (defined as the area along the park road from the intersection with the George Parks Highway to park headquarters situated at about MP 3.4).

Implementation of the *Entrance Area and Road Corridor Development Concept Plan/EIS* (NPS 1997) is continuing with general programming for all facilities and the design of several development components. Facilities and services in the park entrance area implemented since 1997 include:

- Visitor Center Complex, completed in 2005 with a bookstore/gift shop and cafeteria/deli,
- Murie Science and Learning Center Complex,
- Riley Creek Campground, rehabilitation and expansion completed in 2002,
- Railroad Depot expansion,
- A network of hiking trails that connects the Nenana Canyon to the entrance area and the entrance area to the C-Camp/headquarters area,
- Riley Creek Mercantile, with camper convenience services such as a general store and showers.

The Park has completed several components described in the DCP/EIS for the headquarters area including:

- Rerouting the sled dog demonstration trail,
- Installing Sweet Smelling Toilets (SST) for the dog demonstration area,
- Restoring most of the historic structures in the Headquarters Historic District,
- Conversion of many rehabilitated structures to propane furnaces.

Actions completed in the headquarters area that were decided separately from DCP/EIS have included the following:

- Construction of a new residence (B251) in the historic district in 1994,
- Removal of 31 single-wall underground fuel oil tanks and replacement with double-wall above-ground tanks or propane tanks,
- Excavation and remediation of 2,000 cubic yards of contaminated soils and installation of 9 groundwater monitoring wells,
- Removal and thinning of vegetation to protect from wildfire, as described in the *Environmental Assessment for Hazardous Vegetative Fuel Treatment* (NPS 2003b),
- Expansion of the gravel pad by the steam plant to accommodate parking of employee recreational vehicles,
- Constructing the B&U pad and building (1997-1999),
- Adding 18-ft to the Auto Shop for offices and Alaska Natural History Association warehouse.

The park has plans in the near future to implement other items in the DCP/EIS that include:

- Rehabilitating the entrance area wastewater treatment facility and collection system,
- Constructing an entrance station,
- Bringing the water treatment system into compliance with new regulations,
- Implementation of a community transportation system.

The National Park Service will also implement the components of the C-Camp area plan (NPS 2006), which itself was an implementation document for the DCP/EIS but included other items:

- A new road parallel to the east side of the residential area would be constructed,
- An ESB and separate Annex would be constructed near the existing C-Camp entrance, along with a parking lot for 29 vehicles,
- A new vehicle fueling system would be located directly south of the Auto Shop pad along the new parallel road,
- The Auto Shop pad would be expanded to the east.

Other future and ongoing projects in the headquarters area that were not specifically addressed in the DCP/EIS include:

- Cyclically removing brush from beneath the overhead power line,
- Repairing roads and trails,
- Continuing remediation of contaminated soils and groundwater at various locations,
- Replacing the Rock Creek bridge located near milepost 3 of the park road,
- Rehabilitating the park road at mile 4 and mile 4.5,
- Periodic resurfacing of park road in the entrance area, and
- Deepening of the parking spaces on the road between building 51 and the duplex (B252).

4.3 Impacts of Alternative 1: No Action

4.3.1 Air Quality

There would be no new construction activities under Alternative 1 or other activities that might cause impacts to air quality.

Cumulative Effects

Construction activities in the entrance area (including headquarters) have been ongoing over the past 8 years and are projected to continue, as have associated emissions from construction equipment. Projects have included the Riley Creek Campground expansion, Denali Depot expansion, the Murie Science and Learning Center development, and the Visitor Center campus, and will include the approved actions in the 2006 *C-Camp Improvements Environmental Assessment* and activities involved with rehabilitating the park road at mileposts 4.0 and 4.5. While the continuous nature of the projects in this time frame mean the impacts could be characterized as short-term, the effects are definitely localized and oftentimes imperceptible. Potential long-term air quality effects from creating new visitor opportunities in the entrance area

and thereby encouraging more visitors and visitor-related traffic are offset by encouraging visitors to leave their cars outside of the park. New trail and pedestrian connections, a community transportation system, the Savage River shuttle, and limits on road use past Savage all serve or will serve to minimize the increase in emissions associated with new visitor opportunities. Overall, there are minor cumulative adverse impacts to air quality, but this alternative does not contribute to them.

Conclusion
There would be no additional adverse impacts to air quality under this alternative, although there would be continuing minor adverse impacts from other construction activities in the entrance area. This alternative would not result in the impairment of the park's air quality.

4.3.2 Vegetation, Soils, and Wetlands

There would be no new disturbance to park vegetation, soils, or wetlands under this alternative since there would be no new construction projects. The absence of action also would not lead to destruction of vegetation, soils, or wetlands in the headquarters area.

Cumulative Effects
The existing development in the entrance area includes areas cleared of vegetation for the Visitor Center Complex, the Murie Science and Learning Center complex, the Wilderness Access Center, the Riley Creek Campground, the Riley Creek Mercantile, the water treatment plant, the airstrip, the railroad depot, the park road, C-Camp residential and maintenance facilities, and headquarters-area administrative buildings and residences. The total acreage of existing disturbance to vegetation and soils in the entrance area is about 83 acres (NPS 2005a). Indirect impacts on vegetation and soils from these past and ongoing activities include creation of social trails and trampling of vegetation, filling of vegetated areas, and introduction of invasive species. Other indirect impacts include channelization of runoff from paved areas and footpaths and subsequent erosion of soils. These past and present impacts can be seen at many of the developed sites in the entrance area, and could be considered moderate impacts on vegetation and soils.

Actions approved in the *C-Camp Improvements Environmental Assessment* will disturb another 4.6 acres, and the park road rehabilitation at mileposts 4 and 4.5 are expected to result in 2.6 acres of vegetation loss. Total quantifiable past, present, and foreseeable future activities other than those proposed in this alternative are 90.2 acres. Additional foreseeable future actions that could have the highest potential to impact vegetation and soils include the replacement of the Rock Creek bridge, rehabilitation of the Rock Creek water system, and cyclic brush removal beneath power lines.

Wetlands
About 4 acres of wetlands have been impacted by previous road, trail and building construction in the park entrance area. Pending C-Camp improvements and road rehabilitation activities at milepost 4 and 4.5 will result in 1.7 acres of additional wetland loss.

Overall, the cumulative adverse impacts on vegetation, wetlands, and soils would be moderate. This alternative would be responsible for none of the cumulative impacts.

Conclusion
This alternative would cause no additional impacts to vegetation, soils, or wetlands in the headquarters or entrance areas of the park. Previous disturbance and projected future disturbance has caused moderate adverse impacts. This alternative would not result in impairment of the park's vegetation, wetlands, or soils.

4.3.3 Wildlife and Habitat

There would be no new development activity under this alternative, so no new disturbance to wildlife or wildlife habitat.

Cumulative Effects
There are 83 acres of developed land in the entrance area of Denali. The *C-Camp Improvements EA* called for another 4.6 acres and the milepost 4 and 4.5 road rehabilitation EA proposes 2.6 additional acres. Other foreseeable projects such as the Rock Creek bridge replacement and the construction of an entrance station could have small additional effects. Cumulatively, this action plus previous developments in the entrance area and headquarters/C-Camp area have gradually reduced the amount of habitat available for wildlife. However, these are still very small nodes of development in relationship to the vast acreage of similar surrounding habitat, much of which is protected as designated wilderness. Overall, there are moderate adverse impacts to wildlife and wildlife habitat, none of which are caused by this alternative.

Conclusion
There would be no additional effects on wildlife habitat as a result of this alternative, although cumulative moderate adverse effects remain from other developments in the park entrance area. This alternative would not result in the impairment of the park's wildlife habitat.

4.3.4 Cultural Resources

There would be no actions taken under this alternative to either rehabilitate or harm cultural resources.

Cumulative Effects
Since the Headquarters Historic District was added to the National Register of Historic Places in 1987, National Park Service activities have both enhanced and detracted from the character of the district. Historic building rehabilitation since completion of the 1997 *Entrance Area and Road Corridor DCP* has emphasized the reconstruction of the historic exterior appearance of the buildings, such as the garage facade on the eastern portion of the Resources building (B102) and the loading dock and doorway reconfiguration on the interpretive building (B101). However, new non-contributing structures have been added to the district including the SST serving kennels visitors in 2005 and one residence (B251) in 1994. Formal and informal parking has expanded along road edges.

The cumulative effects of the proposed action along with the effects of other past, present, and foreseeable future actions have been mixed, but with an overall moderate beneficial influence

since the completion of the 1997 DCP. The actions proposed in this alternative would not contribute to the benefits achieved.

Conclusion
This alternative would have no additional impact on cultural resources, and a moderate benefit would remain from previous actions. This alternative would not result in the impairment of the park's cultural resources.

4.3.5 Night Sky/Natural Lightscape

This alternative would not result in the installation of additional exterior lighting in the headquarters area, so there would be no impacts to visual or night-sky resources from this alternative.

Cumulative Effects
Night sky visibility has not been an identified concern in previous planning efforts. Lights have been added to new facilities such as the Buildings and Utilities structure at C-Camp and the concession bus barn without contemplation of the overall impact. In addition, various businesses in the Nenana Canyon area have exterior lighting, and the Alaska Department of Transportation and Public Facilities installed streetlights along a half-mile stretch of the Parks Highway when constructing pedestrian trails and highway crossings in the Nenana Canyon. No research has been conducted to identify the level of present impact to night sky visibility in the park entrance area and headquarters area from these lighting efforts. However, the combined impacts are certainly noticeable and change the character of the resource, are long-term, and affect a localized area, though it is the area experienced by most winter Denali visitors. There is a moderate cumulative adverse impact. This alternative does not contribute to that impact.

Conclusion
This alternative would have no additional impact on night sky visibility, which would be subject to moderate adverse impacts from exterior lighting elsewhere in the area. This alternative would not result in the impairment of the park's night sky visibility or natural lightscape.

4.3.6 Visitor Use and Recreation

There are no actions proposed under this alternative that would affect visitor use and recreation.

Cumulative Effects
The 1997 *Entrance Area and Road Corridor DCP* articulated a strategy to enhance visitor opportunities in the entrance area of the park. Combined with the extensive new visitor facilities centered on the Denali Visitor Center and improvements planned or underway in the Savage River area, the National Park Service has provided long-term, substantial improvements in the opportunities for visitors to use, recreate in, and learn about Denali. Although localized in the Denali entrance area, because virtually all of the park visitors pass through the entrance area the significance of the improvements can be considered park-wide. Thus there are major cumulative benefits of past, present, and foreseeable future actions. This alternative would contribute none of those benefits.

Conclusion
This alternative would have no additional impact on visitor use and recreation, which has seen major benefits with implementation of other elements of the 1997 *Entrance Area and Road Corridor DCP*.

4.3.7 Local Communities and Local Economy

There are no actions proposed under this alternative that would impact local communities or the local economy.

Cumulative Effects
Since the completion of the 1997 *Entrance Area and Road Corridor DCP*, the National Park Service has continually invested in new entrance area facilities. The construction of the entrance area visitor facilities as well as rehabilitation of administrative facilities has provided a steady flow of federal dollars into the local and regional economy, and created local employment. The National Park Service has spent approximately $40 million on frontcountry projects since 1997. Overall, the implementation of the 1997 *Entrance Area and Road Corridor DCP* will provide moderate benefits to the local community and economy, but implementation of this alternative would provide none of those benefits.

A goal of the 1997 *Entrance Area and Road Corridor DCP* was to provide a wide range of visitor opportunities in the Denali frontcountry, with a particular emphasis on increasing the number of opportunities in the entrance area and along the park road to Savage River. A new destination visitor center, the Murie Science and Learning Center, Savage Cabin living history, and new trails, picnic areas, and rest stops have all contributed to achieving this goal. Creating new opportunities provides a reason for visitors to spend more time at Denali, and as a result to spend more money buying local goods and services, creating moderate benefits for the local economy. Although no documentation of additional expenditures by park visitors has been completed since the opening of the new facilities, two-day stays are becoming more typical for Denali visitors than the previous one-day norm for most visitors (HDR 2006). This alternative would not contribute to this local benefit.

Conclusion
There would be no additional beneficial or adverse impacts to local communities or economies under this alternative, which have received moderate direct and indirect benefits from prior National Park Service projects in the Denali frontcountry.

4.3.8 Park Management and Operations

There would be no changes to park management and operations under this alternative, and no beneficial or adverse impacts.

Cumulative Effects
Implementation of the 1997 *Entrance Area and Road Corridor DCP* has generally improved park management and operations, which has been particularly important for addressing the

increased complexity of visitor facilities and services and the increasing number of visitors over time. In the headquarters area, the rehabilitation of historic structures into modern, functional offices has increased office capacity without adding new buildings. The construction of the Building and Utilities building in C-Camp and expansion of the Auto Shop also provided new office space to accommodate growing staff and responsibilities. Changes such as the conversion from fuel oil to propane for heating reduce operational complexity, and improvements such as the forthcoming repair of the mile 4 and 4.5 section of the park road remove maintenance burdens. These improvements and efficiencies help to offset the impact of increasing complexity and scale of park operations. Overall, there have been major beneficial impacts on park management and operations from improvements in the headquarters area, but this alternative would be responsible none of them.

Conclusion
This alternative would have no additional impacts on park management and operations, which otherwise have seen major beneficial impacts from improvements in the headquarters area.

4.4 Impacts of Alternative 2

4.4.1 Air Quality

The increase in construction activities in the headquarters area necessary to implement this alternative would cause some increase in airborne pollutants over existing levels, as noted in the 1997 *Entrance Area and Road Corridor DCP*. These pollutants would include carbon monoxide, sulfur dioxide, nitrogen oxides, volatile organic compounds, and particulates, primarily originating from construction equipment. However, the impacts would be localized and temporary. There would thus be minor adverse impacts to the park's air quality.

Cumulative Effects
Construction activities in the entrance area (including headquarters) have been ongoing over the past 8 years and are projected to continue, as have associated emissions from construction equipment. Projects include the Riley Creek Campground expansion, Denali Depot expansion, the Murie Science and Learning Center development, and the Visitor Center campus, and will include the approved actions in the 2006 *C-Camp Improvements Environmental Assessment* and activities involved with rehabilitating the park road at mileposts 4.0 and 4.5. While the continuous nature of the projects in this time frame mean the impacts could be characterized as short-term, the effects are definitely localized and oftentimes imperceptible. Potential long-term air quality effects from creating new visitor opportunities in the entrance area and thereby encouraging more visitors and visitor-related traffic are offset by encouraging visitors to leave their cars outside of the park. New trail and pedestrian connections, a community transportation system, the Savage River shuttle, and limits on road use past Savage all serve or will serve to minimize the increase in emissions associated with new visitor opportunities. Overall, there are minor cumulative adverse impacts to air quality, of which this project contributes a minor portion.

Conclusion
The increase in construction activity would contribute to the minor adverse impacts to air quality that have taken place because of implementation of the *Entrance Area and Road Corridor DCP*. This alternative would not result in impairment the park's air quality.

4.4.2 Vegetation, Soils, and Wetlands

There would be moderate adverse impacts to vegetation, soils, and wetlands from the actions in this alternative. These adverse impacts result from disturbance of previous undeveloped ground and vegetation. Adverse impacts arise from the direct loss of habitat, direct loss of native plant cover, loss of natural wetlands, and a potential reduction in function such as biomass production. The impacts on soils would include exposure of local soils to potential erosion, and invasive plant species.

Most new disturbance in this alternative is associated with the expansion of the parking lot behind the Cache (B103), the service road realignment, the new kennels bus parking and turnaround, the parking lot behind the Resources building (B102 and B118), the new administrative building, the new residential area parking lot, and the construction of a new duplex and driveway, and the 7/10 acre enlargement to the leach field. Collectively these projects would cause direct loss of 2.4 acres of native plant cover and a loss of 0.6 acres of wetlands. Smaller areas would also be cleared for garages and trails, although many of these are in already disturbed areas. Roadside vegetation would also be thinned to the west of the visitor parking lot to increase sight distance on the park road.

Potential indirect impacts associated with the construction of the parking areas and roads include sedimentation of adjacent habitats and pollutants introduced from road runoff, and potential introduction of invasive species, subsequently reducing ecological diversity. Best Management Practices and design standards can minimize contaminant introduction from road runoff. Indirect impacts associated with construction of chip-seal trails and paths include habitat fragmentation and increased edge effects, potential introduction of exotic species, and subsequent reduction of ecological diversity.

The adverse direct and indirect impacts to vegetation are localized, but represent permanent obvious change to the resource. The adverse impacts are therefore moderate overall.

Cumulative Effects
The existing development in the entrance area includes areas cleared of vegetation for the Visitor Center Complex, the Murie Science and Learning Center complex, the Wilderness Access Center, the Riley Creek Campground, the Riley Creek Mercantile, the water treatment plant, the airstrip, the railroad depot, the park road, C-Camp residential and maintenance facilities, and headquarters-area administrative buildings and residences. The total acreage of existing disturbance to vegetation and soils in the entrance area is about 83 acres (NPS 2005a). Indirect impacts on vegetation and soils from these past and ongoing activities include creation of social trails and trampling of vegetation, filling of vegetated areas, and introduction of invasive species. Other indirect impacts include channelization of runoff from paved areas and footpaths and subsequent erosion of soils. These past and present impacts can be seen at many of the developed

sites in the entrance area, and could be considered moderate impacts on vegetation and soils.

Actions approved in the *C-Camp Improvements Environmental Assessment* will disturb another 4.6 acres, and the park road rehabilitation at mileposts 4 and 4.5 are expected to result in 2.6 acres of vegetation loss. Total quantifiable past, present, and foreseeable future activities other than those proposed in this alternative are 90.2 acres. Additional foreseeable future actions that could impact vegetation and soils include the replacement of the Rock Creek Bridge, rehabilitation of the Rock Creek water system, and cyclic brush removal beneath power lines, have the highest potential to impact vegetation and soils.

Wetlands
About 4 acres of wetlands have been impacted by previous road, trail and building construction in the park entrance area. Pending C-Camp improvements and road rehabilitation activities at milepost 4 and 4.5 will result in 1.7 acres of additional wetland loss. Overall, the cumulative adverse impacts on vegetation, wetlands, and soils would be moderate. This alternative would be responsible for 0.6 acres of a total of 2.3 acres of known disturbance.

Conclusion
The long-term, noticeable, although localized adverse impacts to vegetation, soils, and wetlands would be moderate under this alternative. There would be no impairment of vegetation, soil, or wetland resources.

4.4.3 Wildlife and Habitat

There would be minor adverse impacts to wildlife and wildlife habitat as a result of the actions in this alternative. Impacts would result both from new development on undisturbed ground and from the noise and other disturbance associated with construction activities.

The actions in this alternative would result in 2.4 acres of new disturbance associated with new parking areas, roadways, and structures. There are no sensitive habitats in the area, although 0.6 acres are wetlands. Because these areas are very close to existing developments and human activity areas, they are not utilized to any great degree by large mammals such as grizzly bears or moose. There is an abundance of similar habitat nearby, and small mammals and birds utilizing these areas would likely simply move to these areas. There would be an increase in edge effects and small-scale habitat fragmentation. All of these effects would be permanent, noticeable changes in the quality of the resource, although very localized, amounting to a moderate adverse impact overall.

Construction activities would also have an impact on wildlife. These activities would likely stretch out over several years as different individual projects are funded and implemented. Operations associated with the proposed construction and development would temporarily produce noise and activity levels that could cause localized displacement and disturbance of resident wildlife. However, some birds and small mammals that utilize habitats near headquarters may have become habituated to some degree to noise and human activity. There would continue to be activity-avoidance of the general area by large mammals; new construction at headquarters is not likely to increase this impact. For these reasons, any disturbance of wildlife from an increase in activity or operation of the proposed facilities would be minor.

Some small mammals, such as snowshoe hare and Arctic ground squirrels, could potentially experience direct mortality during construction activities. However, given the relatively small amount of habitat involved, the low numbers of affected individuals, and the likelihood that small mammals would likely occupy adjacent habitats, the impacts of mortality on wildlife would be considered minor.

Cumulative Effects

There are 83 acres of developed land in the entrance area of Denali. The *C-Camp Improvements EA* called for another 4.6 acres and the milepost 4 and 4.5 road rehabilitation EA proposes 2.6 additional acres. Other foreseeable projects such as the Rock Creek bridge replacement and the construction of an entrance station could have small additional effects. Cumulatively, this action plus previous developments in the entrance area and headquarters/C-Camp area have gradually reduced the amount of habitat available for wildlife. However, these are still very small nodes of development in relationship to the vast acreage of similar surrounding habitat, much of which is protected as designated wilderness. Overall, there are moderate adverse impacts to wildlife and wildlife habitat, of which this action contributes a minor amount.

Conclusion

There would be moderate adverse impacts to wildlife and wildlife habitat that result from implementation of the actions in this alternative. There would be no impairment of wildlife resources.

4.4.4 Cultural Resources

The cultural resource affected by actions in this alternative would be the historic buildings and cultural landscape of the Headquarters Historic District, which would receive moderate beneficial impacts. The actions proposed in the alternative would rehabilitate the cultural landscape of the Headquarters Historic District by returning it to an appearance more similar to what it had during the district's historic period of significance between 1928 and 1941. Specific actions that would accomplish this rehabilitation include:

- Removal of some of the bituminous pavement that was put in place after World War II to accommodate vehicle parking and circulation
- Removal of the roadside parking areas adjacent to the main headquarters driveway behind the Resources building (B102).
- Creation of a pedestrian area in the area between the Overthere (B101), the Cache (B103), the Headquarters building (B21) and the Communications Center (B141).
- Removal of through bus-traffic from the core historic area.
- Narrowing roadways elsewhere by removing bituminous pavement and planting native vegetation along the road edges, and creating a screen of natural vegetation between the road edge and lawns. These actions would take place in both the residential area as well as the administrative office area, including removing the pavement from the drainage swale in front of the Barn (B106).
- Removing the pipe rack and storage building from view at the end of the main headquarters driveway.
- Preserving the configuration of the vegetated island that separates the visitor parking lot from the park road, including the historic configuration of flagpole, boulder, and sign.

- Restoration of the historic turnaround loop at the terminus of the main headquarters driveway.
- Rehabilitation of the cultural landscape within the Headquarters Historic District using the fixtures, signs, and other landscape elements recommended by the *Cultural Landscape Report* (NPS 2007a).

While these projects would rehabilitate the cultural landscape of the Headquarters Historic District, there are others that would have adverse effects on the District's character. The new parking area behind the Resources building (B102 and B118), the sled dog demonstration bus parking loop on the edge of the district, the installation of outdoor lighting, and the new administrative building replacing the Communications Center (B141) (3,500 square foot footprint), and new residential garages on the edges of the district all have the potential to detract from the character of the district to the extent that they did not exist during the historic period of significance. However, the impact of most of these actions would be mitigated through compatible design. The new and expanded employee parking areas would be screened with native vegetation. The lighting fixtures would be selected to be compatible with the rustic appearance of the district. The design of the new structures adjacent to and within the district would have design elements that are compatible with character of the historic structures. However, the proximity and visibility of the large parking lot behind the Cache to the core pedestrian area, the new administrative building which would be noticeably larger than the adjacent historic structures, and the perpetuation of a two-lane paved road through the core historic area are elements of this alternative that would be more difficult to mitigate.

The net result of the action in this alternative would result in a long-term, distinct improvement in the character of one of the park's most important and visible historic sites, and the one most commonly encountered by visitors. This results in a moderate beneficial impact overall.

Cumulative Effects

Since the Headquarters Historic District was added to the National Register of Historic Places in 1987, National Park Service activities have both enhanced and detracted from the character of the district. Historic building rehabilitation since the mid 1980s has emphasized the reconstruction of historic exterior appearance of the buildings, such as the garage facade on the eastern portion of the Resources building (B102) and the loading dock and doorway reconfiguration on the interpretive building (B101). However, new non-contributing structures have been added to the district including the SST serving kennels visitors in 2005 and one residence (B251) in 1994. Formal and informal parking has expanded along road edges.

The cumulative effects of the proposed action along with the effects of other past, present, and foreseeable future actions have been mixed, but with an overall major beneficial influence since the completion of the 1997 DCP. The actions proposed in this alternative would provide a moderate amount of the benefit.

Conclusion

Because this alternative would result in a long-term, noticeable enhancement of one of Denali's most important cultural resources, there would be a moderate benefit to the cultural resources of the park. No impairment of cultural resources would occur.

4.4.5 Night Sky/Natural Lightscape

There would be minor adverse impacts to the natural lightscape of the headquarters area. The impacts would result primarily from the impact of outdoor lighting on the night sky. This alternative shows the addition of 14 exterior light fixtures designed to illuminate pedestrian trails and parking areas. However, the mitigation measures identified in section 2.2.4 would be utilized so that the increase in outdoor lighting would affect primarily visibility within the headquarters area itself, with very minimal impact beyond the headquarters area. The adverse impact on night sky visibility would therefore be long-term, but noticeable only in a localized area.

Cumulative Effects
Night sky visibility has not been an identified concern in previous planning efforts. Lights have been added to new facilities such as the Buildings and Utilities structure at C-Camp and the concession bus barn without contemplation of the overall impact. In addition, various businesses in the Nenana Canyon area have exterior lighting, and the Alaska Department of Transportation and Public Facilities installed streetlights along a half-mile stretch of the Parks Highway when constructing pedestrian trails and highway crossings in the Nenana Canyon. No research has been conducted to identify the level of present impact to night sky visibility in the park entrance area and headquarters area from these lighting efforts. However, the combined impacts are certainly noticeable and change the character of the resource, are long-term, and affect a localized area, though it is the area experienced by most winter Denali visitors. There is moderate cumulative adverse impact. Because of the mitigation suggested in this alternative, the contribution of this action would be minor.

Conclusion
The addition of outdoor lighting as part of this alternative would result in minor adverse impacts to night sky visibility in the Denali entrance area. No impairment of night sky visibility or natural lightscapes would occur.

4.4.6 Visitor Use and Recreation

The actions in this alternative would have moderate beneficial effects on visitor use and recreation. While the actions do not extend to the specific interpretive and recreational opportunities that would accompany the infrastructure changes, the creation of a pedestrian zone in a portion of the core historic district would provide a distinct, long-term, although localized change in recreational opportunities. Advantages include the following:

- Visitors would be able to appreciate the historic structures in the core Headquarters Historic District without standing in an active parking lot or road or having to look over parked cars, which is presently the case.
- Once the vehicle parking is removed there would be opportunities to add interpretive signage to buildings or lead guided walks through the district.
- The new parking for the sled dog demonstration buses would be closer to the sled dog kennels and the location of the demonstrations, enabling visitors with limited mobility to more easily access the demonstrations and the historic kennels building. There would be

an improvement to visitor access by providing a bus loading and unloading area that conforms to standards for accessibility.
- The warming hut and SST near the visitor parking area would be useful to winter visitors who ski, snowshoe, skijor, or mush along the park road.

In this alternative, visitors to the kennels who wished to see other parts of the historic district would not have a pedestrian-only option for walking between the two. There would be more vehicular activity and visible cars traveling through the historic area and parking nearby, potentially providing some disruption to appreciation of the historic district.

In addition, there would be a minor safety benefit to visitors who make use of the visitor parking lot, since clearing of vegetation west of the parking lot should increase the ability to see eastbound traffic.

Cumulative Effects
Making the Headquarters Historic District more visitor-friendly is part of the larger effort articulated in the 1997 *Entrance Area and Road Corridor DCP* to enhance visitor opportunities in the entrance area of the park. Combined with the extensive new visitor facilities centered on the Denali Visitor Center and improvements planned or underway in the Savage River area, the National Park Service has provided long-term, substantial improvements in the opportunities for visitors to use, recreate in, and learn about Denali. Although localized in the Denali entrance area, because virtually all of the park visitors pass through the entrance area the significance of the improvements can be considered park-wide. Thus there are major cumulative benefits of past, present, and foreseeable future actions. The actions in this alternative provide only a minor portion of those overall benefits.

Conclusion
The actions proposed in this alternative would provide moderate beneficial impacts to visitor use and recreational opportunities, and would contribute to the major beneficial impacts resulting from implementation of the provisions of the 1997 *Entrance Area and Road Corridor DCP*.

4.4.7 Local Communities and Local Economy

The actions associated with this alternative would have minor benefits to the local community and economy. Direct economic benefits arise from the construction projects associated with constructing roads and parking lots, building and rehabilitating facilities, and performing utility upgrades, estimated at $11.6 million in construction costs (see appendix C). Some of this work is accomplished through contracts which might result in employment for local workers. On past projects, some of the work has been accomplished through hiring term employees who have often been local residents. In addition, there are indirect benefits to the local economy as contract workers and park employees associated with these projects purchase goods and services in the community. These effects would be short-term, perceptible, and localized, accounting for only minor benefits.

Another indirect benefit arises from the creation of additional visitor destinations which encourage park visitors to remain in the Denali area longer. While this is discussed in more detail

under cumulative effects, the Headquarters Historic District would become one more destination within the experiences offered at Denali that would help justify additional time at the park. Visitors who stay longer would then increase their expenditures for lodging, restaurants, and other services. Additional lodging expenditures also provide additional tax dollars to support Denali Borough services. The effects are likely to be longer-term, but those attributable specifically to this project would be very small.

Cumulative Effects

Since the completion of the 1997 *Entrance Area and Road Corridor DCP*, the National Park Service has continually invested in new entrance area facilities. The construction of the entrance area visitor facilities as well as rehabilitation of administrative facilities has provided a steady flow of federal dollars into the local and regional economy, and created local employment. The National Park Service has spent approximately $40 million on frontcountry projects since 1997. The projects in this alternative would continue this trend by contributing another $11.6 million. Overall, the implementation of the 1997 *Entrance Area and Road Corridor DCP* will provide moderate benefits to the local community and economy, but this project would provide a minor moderate portion of those benefits.

A goal of the 1997 *Entrance Area and Road Corridor DCP* was to provide a wide range of visitor opportunities in the Denali frontcountry, with a particular emphasis on increasing the number of opportunities in the entrance area and along the park road to Savage River. A new destination visitor center, the Murie Science and Learning Center, Savage Cabin living history, and new trails, picnic areas, and rest stops have all contributed to achieving this goal. Enhancing visitor opportunities at the Headquarters Historic District is one further step. Creating new opportunities provides a reason for visitors to spend more time at Denali, and as a result to spend more money buying local goods and services, creating a moderate benefit for the local economy. Although no documentation of additional expenditures by park visitors has been completed since the opening of the new facilities, two-day stays are becoming more typical for Denali visitors than the previous one-day norm for most visitors (HDR 2006). This project would contribute a minor amount to this local benefit.

Conclusion

Implementation of this alternative would have minor benefits to the local and regional community as a result of increased federal expenditures improving park facilities. However, it is a small but important part of the overall implementation of the *Entrance Area and Road Corridor DCP* which has provided moderate benefits to the local community over the past 10 years and will continue to do so in the future, both because of direct expenditures and the addition of new visitor opportunities inside the park.

4.4.8 Park Management and Operations

The alternative presented would have moderate beneficial impacts on park management and operations. The key elements and their effects are as follows.

The creation of a pedestrian area in the core headquarters district would displace employee and administrative vehicle parking, as would the revegetation of the parking lot between the

Administration building (B123) and the Barn (B106). A total of twenty-eight vehicle parking spaces would be removed. These would be partially replaced by adding 9 spaces to an enlarged parking lot behind the Cache (B103) and a net of 6 spaces in a reconfigured parking area behind the Resources building (B118 and B102). An additional 18 spaces of administrative parking would be provided in the current storage and composting area at the end of the road east of the kennels, providing a small increase of 5 spaces over current conditions. For employees who park in the most remote lot, there would be a nominal increase in walking distance compared to parking currently available. Some spaces for loading/unloading and accessible parking would be retained adjacent to the Resources building in front of B102. All new parking spaces would be equipped with electric plug-ins for use in winter.

Circulation of administrative vehicles through the headquarters area would remain the same as at present, since the service road would remain open along its length for administrative traffic. Administrative, maintenance, and delivery vehicles needing to access the Cache, the fire management wing of the Resources building and the interpretive building would have ready access from an active road. Access to the Headquarters building (B21) and the Communications Center (B141) or its replacement would require removal of bollards or other barriers, but this could be easily accomplished and non-emergency activities could be scheduled when conflicts with pedestrians would be less likely to occur.

There would be a long-term, localized safety improvement for park staff because of the increased sight distance at the turn into the headquarters driveway. The thinning of roadside vegetation west of the visitor parking lot would allow westbound turning vehicles to see oncoming traffic much more clearly, providing a minor safety benefit to employees who are the primary users of the headquarters driveway.

The new administrative building would greatly relieve pressure on office space that is particularly acute during the summer season. It would create space for functions that currently do not have a location, such as the central filing system, and allow park staff to move out of temporary trailers that have been utilized for many years. The new storage building east of the kennels would likewise eliminate use of the awkward and unsafe dog food storage area in the attic of the kennels building, and provide additional permanent storage that could be used by other divisions, replacing some of the space in temporary conexes and other sheds in the headquarters area.

Completing the conversion of headquarters heating systems to individual propane furnaces, and perhaps eventually to natural gas, would have several beneficial impacts. First, the park has had repeated problems with leaking fuel tanks and fuel spills associated with heating fuel in the headquarters area. These leaks and spills create an environmental hazard and are costly to clean up. The National Park Service expects to save money from these conversions in the long-run. In addition, the burning of propane and natural gas results in fewer emissions than burning fuel oil. Finally, the utilidor is an extremely inefficient mechanism for distributing heat to the buildings in headquarters, wasting a significant amount of heat in distribution. The conversion to individual furnaces could save funds in this manner as well.

The enlargement of the IT offices and storage (B53) would enable the IT staff to have adequate space to house server equipment and expand storage.

Expansion of the headquarters leach field would enable the wastewater stream from C-Camp to be transferred to the headquarters area for treatment and disposal. Poor soils in the C-Camp area mean that the leach field system there will eventually be untenable. The headquarters area offers the nearest opportunity to dispose of C-Camp wastewater; enabling that opportunity through expansion of the leach field is a major operational benefit.

The new parking lot in the residential area between the duplexes and panabodes would alleviate present problems with inadequate parking caused by residents competing for spaces with people working in offices (particularly the IT shop and panabode) and employees using the Permanent Rec Hall for meetings. While the Permanent Rec Hall function would move to the steam plant in this alternative, the use of the pad south of the steam plant for VIP trailer parking means that the parking need is still unmet without this lot.

The landscaping use of the pad south of the steam plant (B54) for trailer parking for park volunteers solves a problem identified in the *C-Camp Improvements EA* but not resolved. The National Park Service increasingly relies upon volunteers to assist in various tasks providing services to visitors and protecting resources. Older volunteers sometimes have their own recreational vehicles (RV's) or trailers that they wish to live in during their volunteer commitment. The park lacks places for these trailers in the entrance area. This alternative would provide four sites, which would be a noticeable improvement although it would not fully meet the previously determined need for six sites.

The addition of outdoor lighting would enhance employee safety when walking through the headquarters area during winter months. Snow and ice combine with darkness to make treacherous footing in winter, which would be exacerbated by asking employees to walk further from parking lots to their offices.

Cumulative Effects

Implementation of the 1997 *Entrance Area and Road Corridor DCP* has generally improved park management and operations, which has been particularly important for addressing the increased complexity of visitor facilities and services and increasing number of visitors over time. In the headquarters area, the rehabilitation of historic structures into modern, functional offices has increased office capacity without adding new buildings. The construction of the Building and Utilities building in C-Camp and expansion of the Auto Shop also provided new office space to accommodate growing staff and responsibilities. Changes such as the conversion from fuel oil to propane for heating reduce operational complexity, and improvements such as the forthcoming repair of the mile 4 and 4.5 section of the park road remove maintenance burdens. These improvements and efficiencies help to offset the impact of increasing complexity and scale of park operations. Overall, there have been major beneficial impacts on park management and operations from improvements in the headquarters area, and the actions in this alternative would contribute moderately to further benefits.

Conclusion
There would be some minor adverse impacts to employees from the changes in parking and circulation, but overall there would be moderate beneficial impacts to park management and operations resulting from expanded office and storage space, additional housing options for volunteers, better matches between facilities and needs, a wastewater disposal option for C-Camp, outdoor lighting for winter months, and more environmentally benign heating sources.

4.5 Impacts of Alternative 3: NPS Preferred

4.5.1 Air Quality

The increase in construction activities in the headquarters area necessary to implement this alternative would cause some increase in airborne pollutants over existing levels, as noted in the 1997 *Entrance Area and Road Corridor DCP*. These pollutants would include carbon monoxide, sulfur dioxide, nitrogen oxides, volatile organic compounds, and particulates, primarily originating from construction equipment. However, the impacts would be localized and temporary. There would thus be minor adverse impacts to the park's air quality.

Cumulative Effects
Construction activities in the entrance area (including headquarters) have been ongoing over the past 8 years and are projected to continue, as have associated emissions from construction equipment. Projects include the Riley Creek Campground expansion, Denali Depot expansion, the Murie Science and Learning Center development, and the Visitor Center campus, and will include the approved actions in the 2006 *C-Camp Improvements Environmental Assessment* and activities involved with rehabilitating the park road at mileposts 4.0 and 4.5. While the continuous nature of the projects in this time frame mean the impacts could be characterized as short-term, the effects are definitely localized and oftentimes imperceptible. Potential long-term air quality effects from creating new visitor opportunities in the entrance area and thereby encouraging more visitors and visitor-related traffic are offset by encouraging visitors to leave their cars outside of the park. New trail and pedestrian connections, a community transportation system, the Savage River shuttle, and limits on road use past Savage all serve or will serve to minimize the increase in emissions associated with new visitor opportunities. Overall, there are minor cumulative adverse impacts to air quality, of which this project contributes only a minor portion.

Conclusion
The increase in construction activity would contribute to the minor adverse impacts to air quality that have taken place because of implementation of the *Entrance Area and Road Corridor DCP*. This alternative would not result in impairment the park's air quality.

4.5.2 Vegetation, Soils, and Wetlands

There would be moderate adverse impacts to vegetation, soils, and wetlands from the actions in this alternative. These adverse impacts result from disturbance of previous undeveloped ground and vegetation. Adverse impacts arise from the direct loss of habitat, direct loss of native plant

cover, loss of natural wetlands, and a potential reduction in function such as biomass production. The impacts on soils would include exposure of local soils to potential erosion, and invasive plant species.

Most new disturbance in this alternative is associated with the new administrative parking lot west of the visitor parking lot, the service road realignment, the new kennels bus parking and turnaround, the parking lot behind the Resources building (B102 and B118), the VIP trailer pads and associated road, the new administrative building, and the enlargement to the leach field. Collectively these projects would cause direct loss of 2.5 acres of native plant cover and a loss of 0.8 acres of wetlands (see Map A-1, Appendix A). Smaller areas would also be cleared for garages and trails, although many of these are in already disturbed areas. Roadside vegetation would also be thinned to the west of the visitor parking lot to increase sight distance on the park road.

Potential indirect impacts associated with the construction of the parking areas and roads include sedimentation of adjacent habitats and pollutants introduced from road runoff, and potential introduction of invasive species, subsequently reducing ecological diversity. Best Management Practices and design standards can minimize contaminant introduction from road runoff. Indirect impacts associated with construction of chip-seal trails and paths include habitat fragmentation and increased edge effects, potential introduction of exotic species, and subsequent reduction of ecological diversity.

The adverse direct and indirect impacts to vegetation are localized, but represent permanent obvious damage to the resource. The adverse impacts are therefore moderate overall.

Cumulative Effects

The existing development in the entrance area includes areas cleared of vegetation for the Visitor Center Complex, the Murie Science and Learning Center complex, the Wilderness Access Center, the Riley Creek Campground, the Riley Creek Mercantile, the water treatment plant, the airstrip, the railroad depot, the park road, C-Camp residential and maintenance facilities, and headquarters-area administrative buildings and residences. The total acreage of existing disturbance to vegetation and soils in the entrance area is about 83 acres (NPS 2005a). Indirect impacts on vegetation and soils from these past and ongoing activities include creation of social trails and trampling of vegetation, filling of vegetated areas, and introduction of invasive species. Other indirect impacts include channelization of runoff from paved areas and footpaths and subsequent erosion of soils. These past and present impacts can be seen at many of the developed sites in the entrance area, and could be considered moderate impacts on vegetation and soils.

Actions approved in the *C-Camp Improvements Environmental Assessment* will disturb another 4.6 acres, and the park road rehabilitation at mileposts 4 and 4.5 are expected to result in 2.6 acres of vegetation loss. Total quantifiable past, present, and foreseeable future activities other than those proposed in this alternative are 90.2 acres. Additional foreseeable future actions that could impact vegetation, soils, and wetlands include the replacement of the Rock Creek Bridge, rehabilitation of the Rock Creek water system, cyclic brush removal beneath power lines, and the connection of C-Camp wastewater to the park headquarters wastewater system have the highest potential to impact vegetation and soils.

Wetlands
About 4 acres of wetlands have been impacted by previous road, trail and building construction in the park entrance area. Pending C-Camp improvements and road rehabilitation activities at milepost 4 and 4.5 will result in 1.7 acres of additional wetland loss. Overall, the cumulative adverse impacts on vegetation, wetlands, and soils would be moderate. This alternative would be responsible for 0.8 acres of the total 2.5 acres of cumulative impacts.

Conclusion
The long-term, noticeable, although localized adverse impacts to vegetation, soils, and wetlands would be moderate under this alternative. There would be no impairment of these resources.

4.5.3 Wildlife and Habitat

There would be minor adverse impacts to wildlife and wildlife habitat as a result of the actions in this alternative. Impacts would result both from new development on undisturbed ground and from the noise and other disturbance associated with construction activities.

The actions in this alternative would result in 2.5 acres of new disturbance associated with new parking areas, roadways, and small structures (garages). There are no sensitive habitats in the area, although 0.8 acres are wetlands. Because these areas are very close to existing developments and human activity areas, they are not utilized to any great degree by large mammals such as grizzly bears or moose. There is an abundance of similar habitat nearby, and small mammals and birds utilizing these areas would likely simply move to these areas. There would be an increase in edge effects and small-scale habitat fragmentation. All of these effects would be permanent, noticeable changes in the quality of the resource, although very localized, amounting to a moderate adverse impact overall.

Construction activities would also have an impact on wildlife. These activities would likely stretch out over several years as different individual projects are funded and implemented. Operations associated with the proposed construction and development would temporarily produce noise and activity levels that could cause localized displacement and disturbance of resident wildlife. However, some birds and small mammals that utilize habitats near headquarters may have become habituated to some degree to noise and human activity. There would continue to be activity-avoidance of the general area by large mammals; new construction at headquarters is not likely to increase this impact. For these reasons, any disturbance of wildlife from an increase in activity or operation of the proposed facilities would be minor.

Some small mammals, such as snowshoe hare and Arctic ground squirrels, could potentially experience direct mortality during construction activities. However, given the relatively small amount of habitat involved, the low numbers of affected individuals, and the likelihood that small mammals would likely occupy adjacent habitats, the impacts of mortality on wildlife would be considered minor.

Cumulative Effects
There are 83 acres of developed land in the entrance area of Denali. The *C-Camp Improvements EA* called for another 4.6 acres and the milepost 4 and 4.5 road rehabilitation EA proposes 2.6

additional acres. Other foreseeable projects such as the Rock Creek bridge replacement and the construction of an entrance station could have small additional effects. Cumulatively, this action plus previous developments in the entrance area and headquarters/C-Camp area have gradually reduced the amount of habitat available for wildlife. However, these are still very small nodes of development in relationship to the vast acreage of similar surrounding habitat, much of which is protected as designated wilderness. Overall, there are moderate adverse impacts to wildlife and wildlife habitat, of which this action contributes a minor amount.

Conclusion
There would be moderate adverse impacts to wildlife and wildlife habitat that result from implementation of the actions in this alternative. There would be no impairment of wildlife resources.

4.5.4 Cultural Resources

The cultural resource affected by action in this alternative would be historic buildings and the cultural landscape of the Headquarters Historic District, which would receive major beneficial impacts. The actions proposed in the alternative would rehabilitate the cultural landscape of the Headquarters Historic District by returning it to an appearance more similar to what it had during the district's historic period of significance between 1928 and 1941. Specific actions that would accomplish this rehabilitation include:

- Removal some of the bituminous pavement that was put in place after World War II to accommodate vehicle parking and circulation.
- Creation of a pedestrian area in the core historic district extending almost continuously from the kennels to the visitor parking lot.
- Narrowing roadways elsewhere by removing bituminous pavement and planting native vegetation along the road edges, and creating a screen of natural vegetation between the road edge and lawns. These actions would take place in both the residential area as well as the administrative office area, including removing the pavement from the drainage swell in front of the Barn (B106).
- Converting the road that connects the Administration building (B123) and the residential area past the "John" house (B112) to a pedestrian trail.
- Removing the pipe rack and storage building from view at the end of the main headquarters driveway.
- Preserving the configuration of the vegetated island that separates the visitor parking lot from the park road, including the historic configuration of flagpole, boulder, and sign.
- Restoration of the historic turnaround loop at the terminus of the main headquarters driveway.
- Removal of the parking lot behind the Cache (B103).
- Rehabilitation of the cultural landscape within the Headquarters Historic District using the fixtures, signs, and other landscape elements recommended by the Cultural Landscape Report (NPS 2007a).

While these projects would rehabilitate the cultural landscape of the Headquarters Historic District, there are others that would have adverse effects on the District's character. The new parking area behind the Resources building (B102 and B118), the sled dog demonstration bus

parking loop on the edge of the district, the installation of outdoor lighting, the new administrative building replacing the Communications Center (B141), and new residential garages all have the potential to detract from the character of the district to the extent that they did not exist during the historic period of significance. The new garage building serving the residents in housing units B111 and B22 would be a new non-contributing structure within the District. However, the impact of all of these actions would be mitigated through design. The new employee parking area would be screened with native vegetation. The lighting fixtures would be selected to be compatible with the rustic appearance of the district. The scale of the new administrative building would be compatible with the scale of the buildings in the historic district it borders. The design of the new structures adjacent to and within the district would have design elements that are compatible with character of the historic structures.

The net result of the action in this alternative would result in a long-term, substantial improvement in the character of one of the park's most important and visible historic sites, and the one most commonly encountered by visitors. This results in a major beneficial impact overall.

Cumulative Effects
Since the Headquarters Historic District was added to the National Register of Historic Places in 1987, National Park Service activities have both enhanced and detracted from the character of the district. Historic building rehabilitation since the mid-1980s has emphasized the reconstruction of historic exterior appearance of the buildings, such as the garage facade on the eastern portion of the Resources building (B102) and the loading dock and doorway reconfiguration on the interpretive building (B101). However, new non-contributing structures have been added to the district including the SST serving kennels visitors in 2005 and one residence (B251) in 1994. Formal and informal parking has expanded along road edges.

The cumulative effects of the proposed action along with the effects of other past, present, and foreseeable future actions have been mixed, but with an overall major beneficial influence since the completion of the 1997 DCP. The actions proposed in this alternative would constitute a substantial portion of the benefits achieved, sharing equally with the effects of the historic structure rehabilitations.

Conclusion
Because this alternative would result in a long-term, substantial enhancement of one of Denali's most important cultural resources, there would be major benefits to the cultural resources of the park. No impairment of cultural resources would occur.

4.5.5 Night Sky/Natural Lightscape

There would be minor adverse impacts to the night sky visibility of the headquarters area. The impacts would result primarily from the impact of outdoor lighting on the night sky. This alternative shows the addition of 22 exterior light fixtures designed to illuminate pedestrian trails and parking areas. However, the mitigation measures identified in section 2.2.4 would be utilized so that the increase in outdoor lighting would affect primarily visibility within the headquarters

area itself, with very minimal impact beyond the headquarters area. The adverse impact on night sky visibility would therefore be long-term, but noticeable only in a localized area.

Cumulative Effects
Night sky visibility has not been an identified concern in previous planning efforts. Lights have been added to new facilities such as the Buildings and Utilities structure at C-Camp and the concession bus barn without contemplation of the overall impact. In addition, various businesses in the Nenana Canyon area have exterior lighting, and the Alaska Department of Transportation and Public Facilities installed streetlights along a half-mile stretch of the Parks Highway when constructing pedestrian trails and highway crossings in the Nenana Canyon. No research has been conducted to identify the level of present impact to night sky visibility in the park entrance area and headquarters area from these lighting efforts. However, the combined impacts are certainly noticeable and change the character of the resource, are long-term, and affect a localized area, though it is the area experienced by most winter Denali visitors. There is moderate cumulative adverse impact. Because of the mitigation suggested in this alternative, the contribution of this action would be minor.

Conclusion
The addition of outdoor lighting as part of this alternative would result in minor adverse impacts to night sky visibility in the Denali entrance area. No impairment of night sky visibility or natural lightscapes would occur.

4.5.6 Visitor Use and Recreation

The actions in this alternative would have moderate beneficial effects on visitor use and recreation. While the actions do not extend to the specific interpretive and recreational opportunities that would accompany the infrastructure changes, the creation of a pedestrian zone stretching almost continuously from the sled dog kennels through the core historic district up to the visitor parking lot would provide a distinct, long-term, although localized change in recreational opportunities. Advantages include the following:

- The approximately 35,000 visitors to the sled dog demonstrations each year would be able to walk into the core historic district without competing with vehicle traffic.
- Visitors would be able to appreciate the historic structures in the core Headquarters Historic District without standing in an active parking lot or road or having to look over parked cars, which is presently the case.
- Once the vehicle parking is removed there would be opportunities to add interpretive signage to buildings or lead guided walks through the district.
- The new parking for the sled dog demonstration buses would be closer to the sled dog kennels and the location of the demonstrations, enabling visitors with limited mobility to more easily access the demonstrations and the historic kennels building. There would be an improvement to visitor access by providing a bus loading and unloading area that conforms to standards for accessibility.
- The warming hut and SST near the visitor parking area would be useful to winter visitors who ski, snowshoe, skijor, or mush along the park road.

In addition, there would be a minor safety benefit to visitors who make use of the visitor parking lot, since the adjustment of the park road alignment and clearing of vegetation west of the parking lot should increase the ability to see eastbound traffic.

Cumulative Effects
Making the Headquarters Historic District more visitor-friendly is part of the larger effort articulated in the 1997 *Entrance Area and Road Corridor DCP* to enhance visitor opportunities in the entrance area of the park. Combined with the extensive new visitor facilities centered on the Denali Visitor Center and improvements planned or underway in the Savage River area, the National Park Service has provided long-term, substantial improvements in the opportunities for visitors to use, recreate in, and learn about Denali. Although localized in the Denali entrance area, because virtually all of the park visitors pass through the entrance area the significance of the improvements can be considered park-wide. Thus there are major cumulative benefits of past, present, and foreseeable future actions, although the actions in this alternative provide only a minor portion of those overall benefits.

Conclusion
The actions proposed in this alternative would provide moderate beneficial impacts to visitor use and recreational opportunities, and would contribute to the major beneficial impacts resulting from implementation of the provisions of the 1997 *Entrance Area and Road Corridor DCP*.

4.5.7 Local Communities and Local Economy

The actions associated with this alternative would have minor benefits to the local community and economy. Direct economic benefits arise from the construction projects associated with constructing roads and parking lots, building and rehabilitating facilities, and performing utility upgrades, estimated at $9.9 million in construction costs (see appendix C). Some of this work is accomplished through contracts which might result in employment for local workers. On past projects some the work has been accomplished through hiring term employees who have often been local residents. In addition, there are indirect benefits to the local economy as contract workers and park employees associated with these projects purchase goods and services in the community. These effects would be short-term, perceptible, and localized, accounting for only minor benefits.

Another indirect benefit arises from the creation of additional visitor destinations which encourage park visitors to remain in the Denali area longer. While this is discussed in more detail under cumulative effects, the Headquarters Historic District would become one more destination within the experiences offered at Denali that would help justify additional time at the park. Visitors who stay longer would then increase their expenditures for lodging, restaurants, and other services. Additional lodging expenditures also provide additional tax dollars to support Denali Borough services. The effects are likely to be longer-term, and those attributable specifically to this project would be very small.

Cumulative Effects
Since the completion of the 1997 *Entrance Area and Road Corridor DCP*, the National Park Service has continually invested in new entrance area facilities. The construction of the entrance

area visitor facilities as well as rehabilitation of administrative facilities has provided a steady flow of federal dollars into the local and regional economy, and created local employment. The National Park Service has spent approximately $40 million on frontcountry projects since 1997. The projects in this alternative would continue this trend by adding $9.9 million in additional construction. Overall, the implementation of the 1997 *Entrance Area and Road Corridor DCP* will provide moderate benefits to the local community and economy, and this project would provide a moderate portion of those benefits.

A goal of the 1997 *Entrance Area and Road Corridor DCP* was to provide a wide range of visitor opportunities in the Denali frontcountry, with a particular emphasis on increasing the number of opportunities in the entrance area and along the park road to Savage River. A new destination visitor center, the Murie Science and Learning Center, Savage Cabin living history, and new trails, picnic areas, and rest stops have all contributed to achieving this goal. Enhancing visitor opportunities at the Headquarters Historic District is one further step. Creating new opportunities provides a reason for visitors to spend more time at Denali, and as a result to spend more money buying local goods and services, creating moderate benefits for the local economy. Although no documentation of additional expenditures by park visitors has been completed since the opening of the new facilities, two-day stays are becoming more typical for Denali visitors than the previous one-day norm for most visitors (HDR 2006). This project would contribute a minor amount to this local benefit.

Conclusion
Implementation of this alternative would have minor benefits for the local and regional community as a result of increased federal expenditures improving park facilities. However, it is a small but important part of the overall implementation of the *Entrance Area and Road Corridor DCP* which has provided moderate benefits to the local community over the past 10 years and will continue to do so in the future, both because of direct expenditures and the addition of new visitor opportunities inside the park.

4.5.8 Park Management and Operations

The alternative presented would have moderate beneficial impacts on park management and operations. The key elements and their effects are as follows.

The creation of a pedestrian area in the core headquarters district would displace employee and administrative vehicle parking. A total of thirty-six vehicle parking spaces would be removed (including one space adjacent to the Barn, B106). These would be replaced by 28 spaces in a new administrative parking lot west of the visitor parking lot, and a net gain of 8 spaces in the reconfigured parking area behind the Resources building, resulting in no net loss of parking spaces. An additional 18 spaces of administrative parking would be provided in the current storage and composting area at the end of the road east of the kennels. Employee walking distances would increase between parking and office spaces, but only nominally. Some spaces for loading/unloading and accessible parking would be retained adjacent to the Resources building in front of B102. All new parking spaces would be equipped with electric plug-ins for use in winter.

Ending routine vehicle circulation through the core historic district could create awkward travel arrangements, however the bus turnaround for sled dog demonstrations, the alternate route to the kennels building, and the elimination of parking west of the Cache (B103) eliminate the need for vehicles to travel through the core historic area. Administrative, maintenance, and delivery vehicles needing to access the Cache, the fire management wing of the Resources building (B118), the interpretive building (B101), or the Communications Center (B141) or its replacement would have to remove bollards or other barriers to be able to drive to their destination, but this would be easily accomplished and non-emergency activities could be scheduled when conflicts with pedestrians would be less likely to occur. Contributing also would be the conversion of the small road between the Administration building (B123) and the residential area to a pedestrian path.

There would be a long-term, localized safety improvement for park staff because of the increased sight distance at the turn into the headquarters driveway. The thinning of roadside vegetation west of the visitor parking lot would allow westbound turning vehicles to see oncoming traffic much more clearly, providing a minor safety benefit to employees who are the primary users of the headquarters driveway.

The new administrative building would relieve some of the pressure on office space that is particularly acute during the summer season. It would create space for functions that currently do not have a location, such as the central filing system, and allow the park to move out of temporary trailers that have been utilized for many years. The new storage building east of the kennels would likewise eliminate use of the awkward and unsafe dog food storage area in the attic of the kennels building, and provide additional permanent storage that could be used by other divisions, replacing some of the space in temporary conexes and other sheds in the headquarters area. Finally, 600 square feet of additional storage would be provided on the gravel pad south of the steam plant (B54).

Completing the conversion of headquarters heating systems to individual propane furnaces, and perhaps eventually to natural gas, would have several beneficial impacts. First, the park has had repeated problems with leaking fuel tanks and fuel spills associated with heating fuel in the headquarters area. These leaks and spills create an environmental hazard and are costly to clean up. The National Park Service expects to save money in the long-run from these conversions. In addition, the burning of propane and natural gas results in fewer emissions than burning fuel oil. Finally, the utilidor is an extremely inefficient mechanism for distributing heat to the buildings in headquarters, wasting a significant amount of heat in distribution. The conversion to individual furnaces could save funds in this manner as well.

The relocation of the Information Technology (IT) staff and equipment to the steam plant would provide adequate space for this function for the first time, as the space could be customized to the needs of the operation. The utilidor connection would make it easily possible to extend existing cabling infrastructure from the current space in building #53 to the steam plant. The addition of a training/conference room would allow this function to move out of the Permanent Rec Hall so that facility could be used fully for its intended purpose as a recreation center for employees living in permanent housing.

The removal of the IT staff and equipment from building #53 would allow the heated space in this structure to be converted into an exercise room for employees and residents. This function is presently located in the small facility called the "Down Under," but is inadequately sized. Physical training is a requirement for rangers and fire fighting staff. The addition of a changing room and restroom in this facility will also enhance its usefulness, as well as providing a restroom for office staff whose buildings have no restroom (such as the concessions management staff in building #107).

In this alternative, there are only two additional parking spaces constructed in the residential area to alleviate current congestion. However, by moving the IT staff and the Permanent Rec Hall's administrative meeting space function to the steam plant, administrative parking can occur on the existing pads south and east of the steam plant.

Expansion of the headquarters leach field would enable the wastewater stream from C-Camp to be transferred to the headquarters area for treatment and disposal. Poor soils in the C-Camp area mean that the leach field system there will eventually be untenable. The headquarters area offers the nearest opportunity to dispose of C-Camp wastewater; enabling that opportunity through expansion of the leach field is a major operational benefit.

Building six trailer parking pads for park volunteers solves a problem identified in the *C-Camp Improvements EA* but not resolved. The National Park Service increasingly relies upon volunteers to assist in various tasks providing services to visitors and protecting resources. Older volunteers sometimes have their own recreational vehicles (RV's) or trailers that they wish to live in during their volunteer commitment. The park lacks places for these trailers in the entrance area. This alternative would provide six beautiful sites near the edge of the bluff overlooking Rock Creek. The sites should be pleasant enough to serve as an incentive for older volunteers to consider opportunities at the park.

The addition of outdoor lighting would enhance employee safety when walking through the headquarters area during winter months. Snow and ice combine with darkness to make treacherous footing in winter, which would be exacerbated by asking employees to walk further from parking lots to their offices.

Cumulative Effects

Implementation of the 1997 *Entrance Area and Road Corridor DCP* has generally improved park management and operations, which has been particularly important for addressing the increased complexity of visitor facilities and services and increasing number of visitors over time. In the headquarters area, the rehabilitation of historic structures into modern, functional offices has increased office capacity without adding new buildings. The construction of the Building and Utilities building in C-Camp and expansion of the Auto Shop also provided new office space to accommodate growing staff and responsibilities. Changes such as the conversion from fuel oil to propane for heating reduce operational complexity, and improvements such as the forthcoming repair of the mile 4 and 4.5 section of the park road remove maintenance burdens. These improvements and efficiencies help to offset the impact of increasing complexity and scale of park operations. Overall, there have been major beneficial impacts on park

management and operations from improvements in the headquarters area, and the actions in this alternative would contribute moderately to further benefits.

Conclusion

Although there would be some minor adverse impacts to employees from the changes in parking and circulation, overall there would be moderate beneficial impacts to park management and operations resulting from expanded office and storage space, additional housing options for volunteers, better matches between facilities and needs, a wastewater disposal option for C-Camp, outdoor lighting for winter months, and more environmentally benign heating sources.

5.0 CONSULTATION AND COORDINATION

There are no cooperating agencies identified for this action. The NPS has determined that there are no Threatened and Endangered Species expected in the project area; therefore Section 7 consultation with the USFWS is not required.

The National Park Service Olmsted Center for Landscape Preservation provided site analysis and treatment recommendations for the rehabilitation of the historic landscape of the Headquarters Historic District. The State Historic Preservation Officer (SHPO) was consulted during preparation of the plan, and will be provided a 30-day review of the environmental assessment. Engineers from the Federal Highway Administration provided draft engineering drawings for some of the road and parking modifications.

Public scoping occurred during April and May, 2007, with scoping comments accepted through May 14. A public scoping meeting was held on May 1 at the Murie Science and Learning Center in the park entrance area.

List of preparers:

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6.0 REFERENCES

Cowardin, L.M., et al. (1979). Classification of wetlands and deepwater habitats of the United States. FWS/OBS 79/31. U.S. Fish and Wildlife Service. Washington, D.C.

Department of Commerce, Community, and Economic Development (DCED). (2005). Alaska Community Database. Alaska Department of Commerce, Community and Economic Development. Accessed on June 2005, from http://www.commerce.state.ak.us/dca/commdb/CF_COMDB.htm.

Fried, N. and B. Windisch-Cole. (2001) "The Denali Borough" in *Alaska Economic Trends*. Vol. 21, No. 9. State of Alaska Department of Labor and Workforce Development. September.

HDR Alaska, Inc. (2006) *Needs Assessment and Feasibility Study for a Community Transportation System, Denali National Park and Preserve.*

National Park Service (NPS). (1985) National Register of Historic Places Inventory-Nomination Form. Mount McKinley National Park Headquarters District/Denali National Park and Preserve Headquarters.

NPS. (1986) *General Management Plan, Land Protection Plan, Wilderness Suitability Review - Denali National Park and Preserve.*

NPS. (1988) *Wilderness Recommendations for Denali National Park and Preserve, Environmental Impact Statement*.

NPS. (1997) *Development Concept Plan, Environmental Impact Statement - Entrance Area and Road Corridor, Denali National Park and Preserve.* USDOI National Park Service, Denali National Park and Preserve. Denali Park, Alaska.

NPS. (2001a) *Environmental Assessment for Construction of New Visitor Facilities in the Entrance Area of Denali National Park*. USDOI National Park Service, Denali National Park and Preserve. Denali Park, Alaska.

NPS. (2001b) *Environmental Assessment for Construction of a Parking Lot for the Residents of Apartment #51 near Park Headquarters*. USDOI National Park Service, Denali National Park and Preserve. Denali Park, Alaska.

NPS. (2003a). *Environmental Assessment for a Gravel Acquisition Plan.* USDOI National Park Service, Denali National Park and Preserve.

NPS. (2003b) *Environmental Assessment for Hazardous Vegetative Fuel Treatment*. USDOI National Park Service, Denali National Park and Preserve.

NPS. (2004) *Environmental Assessment for the Construction of a New Eielson Visitor Center and a Permanent Toklat Rest Stop*. USDOI National Park Service, Denali National Park and Preserve.

NPS. (2005a). *Environmental Assessment for Geotechnical Investigations near C-Camp and in the Park Entrance Area*. USDOI National Park Service, Denali National Park and Preserve.

NPS. (2005b). Birds of Denali, Checklist of Avian Species.

NPS. (2006a) *Environmental Assessment for C-Camp Improvements*. USDOI National Park Service, Denali National Park and Preserve.

NPS. (2007a) *Cultural Landscape Report for Park Headquarters*. Draft, August 2007. Olmsted Center for Landscape Preservation.

NPS (2007b) National Register of Historic Places Registration Form. Denali National Park and Preserve Residences 26, 27, 28, 34/Pre-Mission 66 Houses/Doty Houses. Draft, March, 2007.

NPS (2007c) Monthly Public Use Report for Denali National Park and Preserve. http://www2.nature.nps.gov/stats/. Accessed August 1, 2007.

Reiger, S., et al. (1979). Exploratory Soil Survey of Alaska. U.S. Department of Agriculture, Soil Conservation Service.

Swem, T. (2000). Personal communication. USFWS. Fairbanks, AK. June 9.

United States Geological Service (USGS). (1994). *Interior Alaska Revegetation Plan*. Roseanne Densmore-Ecologist. Alaska Science Center. Anchorage, AK.

Viereck, L.A., et al. (1992). *The Alaska Vegetation Classification*. General Technical Report PNW-GTR-286. USDA Forest Service, Pacific Northwest Research Station. Portland, OR.

Zelenak, J. (2005). Personal communication, Biologist, USFWS, Project Planning Division. Fairbanks Field Office. September 22.

Appendix A – Wetlands Statement of Findings

STATEMENT OF FINDINGS FOR EXECUTIVE ORDER 11990
PROTECTION OF WETLANDS

Headquarters Area Plan

Denali National Park and Preserve, Alaska

September 2007

Recommended: _____ _____
Superintendent, Denali National Park and Preserve Date

Certified for Technical Accuracy and Servicewide Consistency:

_____ _____
Chief, Water Resources Division, Washington Office Date

Approved: _____ _____
Regional Director, Alaska Region Date

PURPOSE AND NEED FOR ACTION

The National Park Service (NPS) has prepared and made available for public review an environmental assessment (EA) to evaluate the impacts of various improvements proposed in a plan for the headquarters area of Denali National Park and Preserve.

The approved 1997 *Entrance Area and Road Corridor Development Concept Plan* for Denali National Park and Preserve (DCP/EIS) identified the need to rehabilitate the buildings and landscape of the Headquarters Historic District to protect the historic resources and provide new interpretive opportunities including walk-through tours. A draft 2007 *Cultural Landscape Report* proposes recommendations regarding the rehabilitation of the cultural landscape, which include scaling back the amount of asphalt and replacing it with native vegetation as well as creating a pedestrian area in the core of the historic district.

To implement these recommendations, the National Park Service proposes to take the following actions that would impact wetlands:

1) Construct a new turnaround loop and parking area for sled dog demonstration buses so that they no longer need to exit through the historic district. This action also requires a slight re-route of the service road and its junction with the park road to provide appropriate grade for buses and a level resting area for buses to wait before turning onto the road.
2) Remove the parking lot behind the Cache (B103) and revegetate to restore the landscape immediately adjacent to the historic district and eliminate the need for employees to drive through the core historic district to access parking.
3) Construct a new parking area behind the Resources building (B102 and B118) to replace administrative parking in the core headquarters area.
4) Construct a new parking area west of the visitor parking lot to replace administrative parking in the core headquarters area.

Executive Order 11990, *Protection of Wetlands*, requires the NPS, and other federal agencies, to evaluate the likely impacts of actions in wetlands. The executive order requires that short and long-term adverse impacts associated with occupancy, modification or destruction of wetlands be avoided whenever possible. Indirect support of development and new construction in such areas should also be avoided wherever there is a practicable alternative.

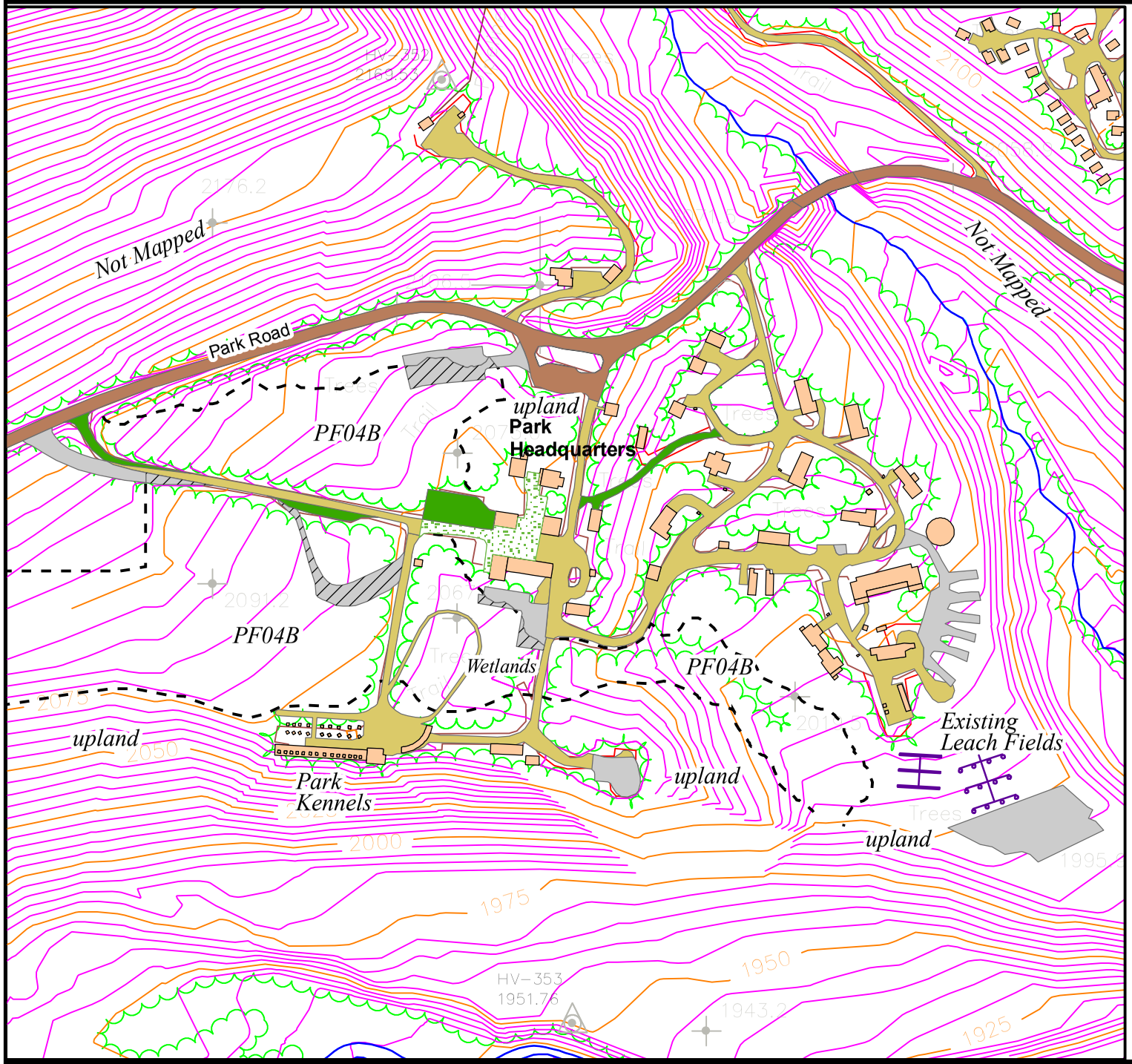
To comply with these orders, the NPS has developed a set of agency policies and procedures which can be found in Director's Order 77-1, *Wetland Protection*, and Procedural Manual 77-1, *Wetland Protection*. The policies and procedures related to wetlands emphasize: exploring all practical alternatives to building on, or otherwise affecting, wetlands; reducing impacts to wetlands whenever possible; and providing direct compensation for any unavoidable wetland impact by restoring degraded or destroyed wetlands on other NPS properties.

The purpose of this Statement of Findings (SOF) is to present the NPS rationale for its proposed plan to construct portions of the 2007 Headquarters Area Plan project in the wetland area. This SOF also documents the anticipated effects on these resources.

Figure A-1 -- Wetlands Delineation

Headquarters Area

Alaska Region
National Park Service
U. S. Department of the Interior



Legend

- Impacted Wetlands

Alternative 3

- New Construction
- Re-vegetate
- Landscaped
- Wetlands Boundary

National Park Service
Denali National Park and Preserve

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W E
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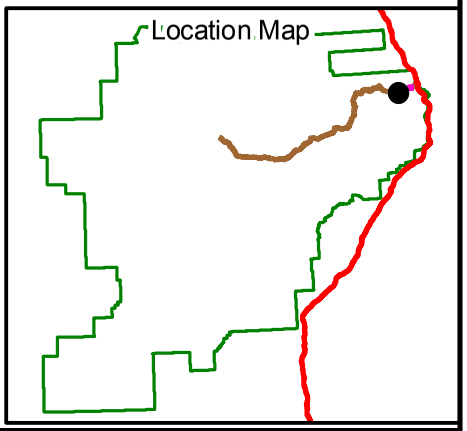
0 70 140 280 420 560 Feet

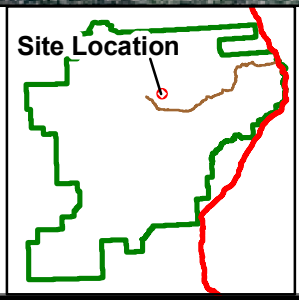
Location Map



Wetlands Compensation Site
Statement of Findings

Figure A-2 - Wetlands Compensation Area Location - Glen Creek, Kantishna Hills, Denali National Park and Preserve, 1.6 acres - Latitude N63.57 / Longitude W150.75, WGS84

Image date: July 2005



Denali NP and Preserve

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WETLANDS WITHIN THE PROJECT AREA

Wetland boundaries were identified and mapped with GPS in the field by NPS personnel (Carwile and Paynter) in May 2007. Of the 2.5 acres that would be newly disturbed by the proposed action, 0.8 acres (Figure A-1) were classified as wetlands under the "Classification of Wetlands and Deepwater Habitats of the United States," the Cowardin Classification System (Cowardin et al. 1979), and are therefore subject to NPS wetlands compliance procedures. Of the 2.5 acres that would be newly disturbed, 1.7 acres are upland, as evidenced by the white spruce associations, the lack of hydrologic indicators, and the presence of well-draining soils.

The wetlands under the proposed bus loop road and parking are characterized by poor drainage, stunted white spruce, a thick feather moss cover with significant patches of sphagnum moss, and scattered diamond-leaf willow. A thick colluvium has built up on the slope leading down to the glacially-cut bench edge just behind the dog kennels and this soil generally has a high-enough clay content to retard oxygen circulation and, when combined with the thick moss cover, keeps the root layer cold late into the growing season.

The wetlands located within the proposed project area are classified as palustrine forested, needle-leaved evergreen, saturated wetlands – PF04B. These wetlands provide habitat for small mammals, such as red squirrels, snowshoe hares, and porcupine; bird species, including gray jays, robins, thrushes, sparrows, and warblers. Moose frequent the area for forage, and it is considered potential moose calving area.

The wetlands under the proposed employee parking lot west of the flagpole are right at the edge of the uplands along the edge of the Rock Creek bench and have fairly thin soils, but are covered with a variety of wetland willow species as well as having a few small seeps, with remanent tussocks creating pockets of hummocky terrain from which grow stunted spruce. Vegetation in the rest of the forested wetlands is typically dominated by white spruce stunted by the nutrient conditions related to the cold soils (Viereck et al. 1992). The understory shrub layer consists of both low and tall shrubs of willow (Salix spp.) diamond leaf willow (*Salix planifolia*), Labrador tea (*Ledum* spp.) and bog blueberry (*Vaccinium uliginosum*). Common ground cover includes feather and sphagnum mosses (*Sphagnum* spp.), leaf lichens, lowbush cranberry (*Vaccinium vitis-idaea*), crowberry (*Empetrum nigrum*) and a variety of forbs (Viereck et al. 1992).

These wetlands function to attenuate snow melt surface flow during break-up and discharge during heavy rain events, which helps reduce sediment input and to keep high values for surface water quality. No water supply points or wells are located downhill between the project site and the park entrance area water supply wells and stream galleries, approximately 8,000 feet away. The park headquarters water supply is located on Rock Creek, upstream of the project area. No floods are known from the site, as forests and open wetlands cover most of the adjacent land and gravelly layers which absorb the rainfall are below the surface soils.

These wetlands also provide habitat for small mammals, such as red squirrels, snowshoe hares, and porcupine; bird species, including gray jays, robins, thrushes, sparrows, and warblers. Moose frequent the area for forage, and it is considered potential moose calving area. No threatened or endangered animal or plant species are found in the area and no research or reference sites have

been developed in the project area.

The wetland type described above is common throughout the eastern areas of Denali National Park and Preserve. The park has determined that the potential wetlands located at the project site are a relatively minor part of the fringe of large acreages of wetlands, are locally common, and that removing the wetlands would have a minor impact on surface water quality, including sediment control and water purification, and animal habitat.

THE PROPOSAL IN RELATION TO WETLANDS

The proposal and alternatives are described in detail in the project Environmental Assessment.

The components of the proposal that would affect wetland areas include the construction of

1) a new 28-space administrative parking area west of the visitor parking lot
2) a new parking area behind the Resources building (B102 and B118),
3) a re-routed service road and its junction with the park road, and
4) a new turnaround loop and parking area for sled dog demonstration buses.

The construction of new parking areas and roads would impact a maximum of 0.8 acres of wetlands.

The expansion into wetlands would be to remove some of the functions that conflict with the integrity of the Headquarters Historic District, such as administrative parking and sled dog demonstration bus traffic, in an effort to rehabilitate the cultural landscape to conditions similar to those during its period of significance.

The wetland soils include up to three feet of colluvium over gravelly glacial till. The construction of the new access road and parking areas would be accomplished by removing the colluvium and replacing it with clean fill on top of the glacial till to the depth necessary to support a paved road for vehicular traffic.

Discharge of dredged or fill material into jurisdictional wetlands is regulated by the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act. According to a recent determination by Corps personnel, the project would not affect wetlands under the jurisdiction of the Corps (Don Rice, pers. comm.).

MITIGATION PROPOSED

Federal and NPS policy is to avoid siting projects in wetlands whenever possible. If circumstances make it impracticable to avoid wetlands, then mitigation of unavoidable impacts must be planned. A NPS wetlands no-net-loss policy requires that wetland losses be compensated for by restoration of wetlands, preferably of comparable wetland type and function and in the same watershed if possible.

Of the 2.5 acres affected by the proposed action, 0.8 acres are classified as wetlands. This SOF commits to 2:1 compensation for the 0.8 acres of disturbed wetlands.

On-Site Rehabilitation

As much as possible, disturbance of wetlands in and around the project area would be avoided. Silt fences would be set up to define construction impact limits. Any areas disturbed by construction activities would be restored to as near natural conditions as possible. Prior to the start of construction activities, the NPS would salvage as much topsoil, organic matter and vegetation as necessary for later use in site revegetation or for use in revegetating other local sites. Salvaged material would be stockpiled separately and would be placed in the disturbed areas following construction.

Some wetlands would likely be replaced on-site. The removal of portions of the existing service road and the parking lot behind the Cache (B103) would allow for the restoration of 0.15 acres of wetlands similar to the ones being lost, but the timeline for this rehabilitation would not be as secure as for the compensation project planned on Glen Creek in the Kantishna Hills and the 0.15 acres is not included in the compensation total.

Off-Site Compensation (Wetland Restoration)

Compensation, by restoration of previously disturbed degraded wetlands, is required under the NPS no-net-loss policy for projects involving disturbance or loss of wetlands. Compensation will occur for the loss of 0.8 acres of palustrine forested wetland. Two-for-one compensation will be completed within the park, rather than one-for-one, because the wetland type being lost is different from the type being restored with the exception of a small amount of acreage on site. By restoring a riverine and palustrine wetland in the Kantishna Hills region at a two-for-one compensation rate, it is anticipated that the wetland functions of wildlife habitat and surface water flow attenuation and purification at the project site will be balanced by the functions of flood control and aquatic habitat restoration regained at a restored former placer mine site. The project site and the compensation site are separated by about 65 miles but are both within Denali National Park. They have different wetland values and functions. The wetlands impacted by the project are described above as a PF04B type. The wetlands to be restored at the compensation site are described below as a PSS1D/R3US5 type.

An ONPS-funded project to restore former placer mined areas in Kantishna is scheduled for 2008-2010. A 1.6 acre portion within the park's upper Glen Creek floodplain has been selected for restoration (Figure A-2) within the scope of this mitigation, for compensation for this headquarters area project. This disturbed site is going to be restored to wetlands classified as riverine upper perennial vegetated unconsolidated shore – R3US5, and palustrine scrub shrub broad-leaved deciduous that is seasonally flooded/well-drained – PSS1D. Restoration plans at the upper Glen Creek site include removing and disposing of debris; stabilizing the channel and floodplain and re-introducing sinuosity where it is missing; stabilizing the access road; and revegetating the stripped areas. Preliminary work will include water and soil sampling and an engineering survey of the existing stream channel, floodplain and upland topography. Discharge measurements will be collected to aid in stream channel design. Soil sampling will assess the geo-chemistry of the upper watershed, and determine the soil's potential for revegetation efforts.

Surveys, both cross-sectional and topographical, will be conducted to supplement site data on the NPS topographic maps. This information will be used to locate and estimate material amounts for use in re-contouring the site and reconstructing the stream channel and floodplain.

Cost estimate for this compensation project is approximately $25,000 per acre, inflation-adjusted from the $17,000 per acre figure calculated in an unpublished report, “Cost Estimation for Reclamation, National Park Service, Alaska Regional Office, January 1994.” This report reviewed three separate mining reclamation projects that were conducted on abandoned claims in Denali National Park and Preserve.

Stream channel and floodplain restoration will be based on the techniques of the 1988 lower Glen Creek restoration project at Denali (Karle and Densmore, 1994a and 1994b). Project design requirements will include a channel capacity for a 1.5-year (bank full) discharge and a floodplain capacity for up to a 100-year discharge. The project design will include the use of bio-revetment, located on meanders, to encourage channel stabilization using natural methods. Brush bars, located in areas of little or no fines, will be employed to dissipate floodwater energy and encourage sediment deposition. Riparian areas will be revegetated with willow cuttings and other appropriate vegetation. Depending on the results from the soils nutrient analysis, fertilizer will be used to ensure a quick start for new vegetation.

Monitoring of the stream channel and riparian areas will occur to determine the success of the reclamation efforts. Vegetation plots and permanently mounted cross-sections will be surveyed and measured again after the first year. Additional seeding and revegetation will occur on areas not vegetated during the first year. It is anticipated that the site will be a functional wetland within 3-5 years after treatment, and will be fully-functioning within 15 years.

ALTERNATIVES CONSIDERED

Alternative 1 describes the existing conditions, No Action, in the headquarters area. No additional facilities would be constructed in the headquarters area and normal activities and operations would continue.

Alternative 2 describes one possible configuration of parking lots and roadways that would accomplish the project purpose of rehabilitating the cultural landscape and creating a pedestrian zone in the core area of the Headquarters Historic District. This alternative creates a new bus turnaround, realigns the service road to enable buses to exit without driving through the administrative area of park headquarters, enlarges the existing administrative parking lot behind the Cache (B103), and adds a new administrative parking area behind the Resources building (B102 and B118). This alternative would impact 0.6 acres of wetlands.

Alternative 3 describes the NPS preferred alternative. This alternative includes the same bus turnaround and service road realignment as in Alternative 2. However, in this alternative the pedestrian zone in the core administrative area is larger and the administrative parking lot behind the Cache (B103) is removed to diminish its intrusion on the character of the historic district. A new administrative parking lot would be constructed west of the visitor parking lot by the headquarters entry sign and flagpole. The new parking lot behind the Resources

building (B102 and B118) is configured to minimize visibility from the sled dog demonstration viewing stands.

The NPS preferred alternative is Alternative 3, which impacts two-tenths of an acre more wetlands than the other action alternative. This alternative better accomplishes the purposes of the project with minimal additional wetland disturbance. The most important purpose is the protection/rehabilitation of the historic character of the central part of the Headquarters Historic District and this is best served by removing bus traffic and vehicle parking from the core of the District and by placing it in expanded satellite lots. None of the impacted wetlands are high value, with either standing water or aquatic resources.

Several other alternatives were discussed during the project scoping process but were then eliminated from further evaluations. These are briefly explained in the Environmental Assessment.

SUMMARY OF ENVIRONMENTAL CONSEQUENCES ASSOCIATED WITH THE PROPOSED ACTION

The potential environmental consequences of the proposed action and alternatives are fully described in the Environmental Assessment.

CONCLUSION

The NPS concludes that there are no practicable alternatives to disturbing 0.8 acres of wetlands for the purposes of constructing new parking areas and roadways that will enable rehabilitation of the cultural landscape of the Headquarters Historic District. Wetlands would be avoided to the maximum extent practicable. The wetland impacts that could not be avoided would be minimized. The NPS acknowledges that some natural localized wetlands processes would be lost during implementation of the Headquarters Area Plan. Impacts on the 0.8 acres of wetlands would be compensated for, on a minimum 2-for-1 acreage basis, by restoring riverine and palustrine wetland habitat and associated riparian habitat in a former placer-mined stream valley in the Kantishna Hills region of the park. The NPS finds that this project is consistent with the Procedural Manual #77-1, *Wetland Protection*, and with NPS Director's Order #77-1, *Wetland Protection*. The NPS finds that this project is in compliance with Executive Order 11990, *Protection of Wetlands*.

REFERENCES

Cowardin, L.M., et al. (1979). Classification of wetlands and deepwater habitats of the United States. FWS/OBS 79/31. U.S. Fish and Wildlife Service. Washington, D.C.

Karle, K.F., and R.V. Densmore. (1994a) Stream and floodplain restoration in Glen Creek, Denali National Park and Preserve. Technical Report NPS/NRWRD/NRTR-94-17. National Park Service, Department of the Interior. Fort Collins, Colorado. 33 pp.

Karle, K.F., and R.V. Densmore. (1994b) Stream and floodplain restoration in a riparian

ecosystem disturbed by placer mining. Ecological Engineering 3: 121–133.

Viereck, L.A., et al. (1992). *The Alaska Vegetation Classification*. General Technical Report PNW-GTR-286. USDA Forest Service, Pacific Northwest Research Station. Portland, OR.

Appendix B – ANILCA 810 Evaluation

SUBSISTENCE – SECTION 810(a) OF ANILCA SUMMARY EVALUATION AND FINDINGS

I. INTRODUCTION

This section was prepared to comply with Title VIII, Section 810 of the Alaska National Interest Lands Conservation Act (ANILCA) of 1980. It summarizes the evaluation of potential restrictions to subsistence uses in Denali National Park and Preserve that could result from the proposed improvements in the headquarters area.

II. THE EVALUATION PROCESS

Section 810(a) of ANILCA states:

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

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

ANILCA created new units and additions to existing units of the National Park System in Alaska. Denali National Park and Preserve was created by ANILCA Section 202(3)(a):

> *The park additions and preserve shall be managed for the following purposes, among others: To protect and interpret the entire mountain massif, and additional scenic mountain peaks and formations; and to protect habitat for, and populations of, fish and wildlife, including, but not limited to, brown/grizzly bears, moose, caribou, Dall sheep,*

> *wolves, swans and other waterfowl; and to provide continued opportunities, including reasonable access, for mountain climbing, mountaineering, and other wilderness recreational activities.*

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

> *. . . to preserve unrivaled scenic and geological values associated with natural landscapes; to provide for the maintenance of sound populations of, and habitat for, wildlife species of inestimable value to the citizens of Alaska and the Nation, including those species dependent on vast relatively undeveloped areas; to preserve in their natural state extensive unaltered arctic tundra, boreal forest, and coastal rainforest ecosystems to protect the resources related to subsistence needs; to protect and preserve historic and archeological sites, rivers, and lands, and to preserve wilderness resource values and related recreational opportunities including but not limited to hiking, canoeing, fishing, and sport hunting, within large arctic and subarctic wildlands and on free-flowing rivers; and to maintain opportunities for scientific research and undisturbed ecosystems.*
>
> *. . . consistent with management of fish and wildlife in accordance with recognized scientific principles and the purposes for which each conservation system unit is established, designated, or expanded by or pursuant to this Act, to provide the opportunity for rural residents engaged in a subsistence way of life to continue to do so.*

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

III. PROPOSED ACTION ON FEDERAL LANDS

Alternatives are described in detail in the Environmental Assessment. Customary and traditional subsistence use on NPS lands will continue as authorized by federal law under all alternatives. Federal regulations implement a subsistence priority for rural residents of Alaska under Title VIII of ANILCA.

The NPS proposes integrated alternatives for a plan for improvements to the park headquarters administrative area. The plan addresses cultural landscape rehabilitation and visitor amenities in the Headquarters Historic District, employee parking, vehicle and pedestrian circulation, utility infrastructure, storage, residential housing, and administrative office space.

The site is in the former Mount McKinley National Park wherein subsistence activities are not allowed.

IV. AFFECTED ENVIRONMENT

Subsistence uses within Denali National Park and Preserve are permitted in accordance with Titles II and VIII of ANILCA. Section 202(3)(a) of ANILCA authorizes subsistence uses, where traditional, in the national park additions and the northwestern and southwestern preserves of

Denali National Preserve. Lands within former Mount McKinley National Park are closed to subsistence uses.

A regional population of approximately 300 eligible local rural residents qualifies for subsistence use of park resources. Resident zone communities for Denali National Park and Preserve are Cantwell, Minchumina, Nikolai and Telida. By virtue of their residence, local rural residents of these communities are eligible to pursue subsistence activities in the new (1980) park additions. Local rural residents who do not live in the designated resident zone communities, but who have customarily and traditionally engaged in subsistence activities within the park additions, may continue to do so pursuant to a subsistence permit issued by the park superintendent in accordance with state law and regulations.

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

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

The NPS recognizes that patterns of subsistence use vary from time to time and from place to place depending on the availability of wildlife and other renewable natural resources. A subsistence harvest in any given year many vary considerably from previous years because of such factors as weather, migration patterns and natural population cycles. However, the pattern is assumed to be generally applicable to harvests in recent years with variations of reasonable magnitude.

V. SUBSISTENCE USES AND NEEDS EVALUATION

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

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

The potential to reduce populations:

Land use activities could have temporary and/or long-term impacts on wildlife habitat, depending on the nature and extent of the disturbance. The alternatives would not adversely affect the distribution or migration patterns of subsistence resources. Therefore, no change in the availability of subsistence resources is anticipated as a result of the implementation of this proposed action.

Restriction of Access:

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

Increase in Competition:

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

VI. AVAILABILITY OF OTHER LANDS

Choosing a different alternative would not decrease the impacts to park resources for subsistence. The preferred alternative is consistent with the mandates of ANILCA, including Title VIII, and the NPS Organic Act of 1916.

VII. ALTERNATIVES CONSIDERED

The alternatives considered for this project were limited to 1) a No Action Alternative and 2) two potential alternatives for an integrated solution that would meet the historic landscape rehabilitation, visitor service, administrative, infrastructure and residential needs within the headquarters area.

VIII. FINDINGS

This analysis concludes that the preferred alternative would not result in a significant restriction of subsistence uses.

Appendix C – Cost Analysis

Category	Alternative 1	Alternative 2	Alternative 3 Preferred Alternative
One-Time Construction & Restoration Costs		9,078,000	7,429,000
Annual Operations and Maintenance Costs	630,382	296,000	296,500
Lifecycle Cost	13,143,644	19,285,144	19,271,344