

2.0 ALTERNATIVES

2.1 INTRODUCTION

This chapter describes several alternatives for managing subsistence ORV use in the 32,159 acre Cantwell Traditional Use Area (TUA). Also discussed are alternatives and actions that have been considered but dismissed from further analysis.

Though the NPS' goal is to implement the plan within 1 to 4 years, funding for implementation is not guaranteed. The plan would establish a vision for the future that would guide year to year ORV management of the Cantwell Traditional Use Area, but full implementation could be many years in the future.

While the NPS would bear the responsibility for directing and managing construction, improvement, and maintenance of any proposed ORV trails or routes, the subsistence ORV users themselves would be encouraged to engage in a cooperative effort with the NPS to provide labor and equipment for a significant portion of this work.

Management alternatives for the TUA were developed with input from the State of Alaska, the Denali Subsistence Resources Commission and other members of the public (see Chapter 5, Consultation and Coordination). The No Action Alternative (Alternative 1) is a required alternative under the 1969 National Environmental Policy Act and provides a baseline for analysis. The No Action Alternative and the action alternatives provide a reasonable range of management options.

The following topics are discussed for each alternative:

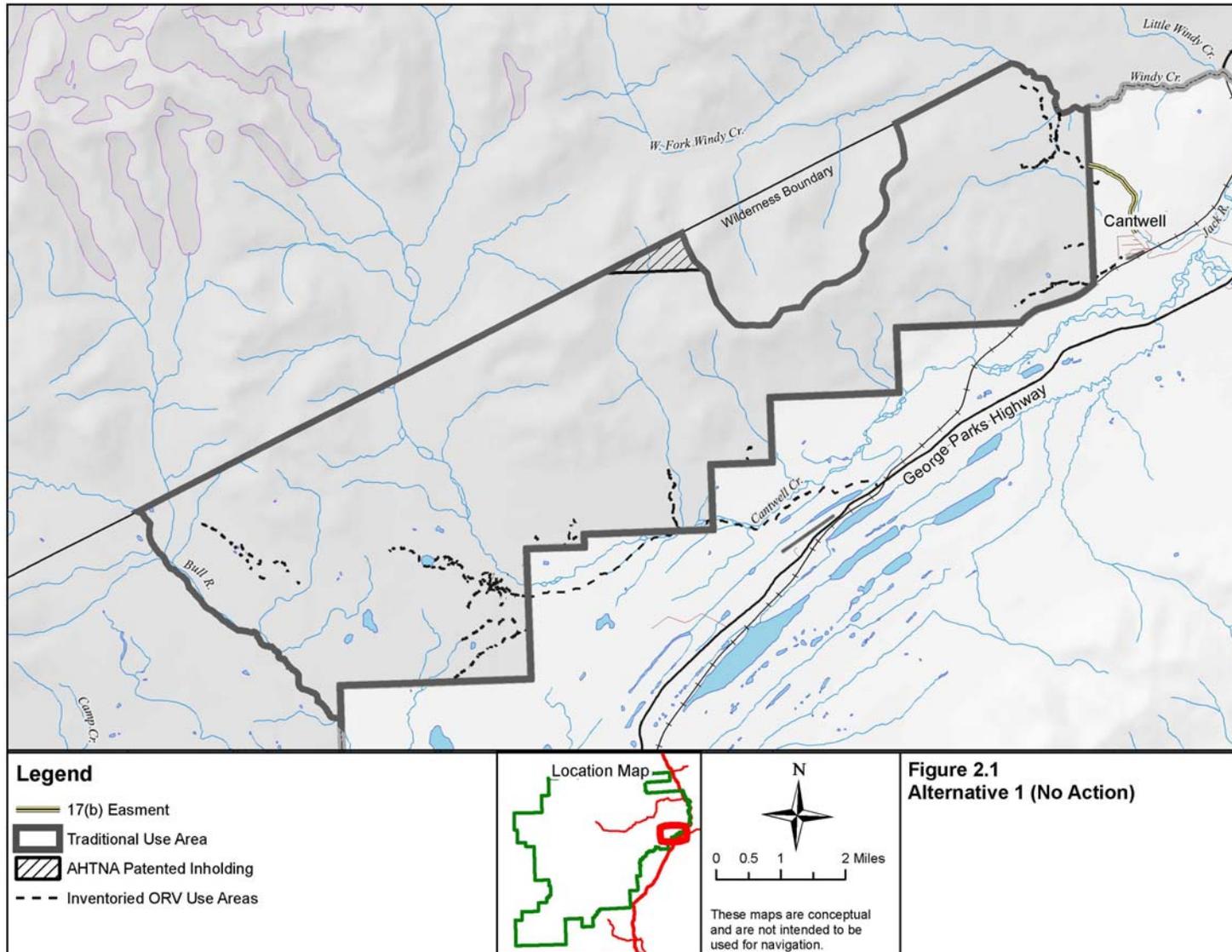
- ORV Use Off-Trail
- ORV Use On Trails
- ORV Use on the Bull River and Upper Cantwell Creek Floodplains
- Closures
- Harvest Limits
- Degradation Levels
- Zoning
- The 17B Easement

In addition to the above topics, monitoring strategies and implementation cost estimates have been developed for each alternative. These are found in Appendix 2 and 3, respectively.

At the end of this chapter, Table 2.4 summarizes the components and attributes of each alternative. Table 2.5 summarizes the predicted impacts for each alternative on the topics of concern.

2.2 ALTERNATIVE 1 (NO ACTION)

Under the No Action Alternative, the NPS would not undertake any new actions to manage subsistence ORV use (see Figure 2.1). NPS qualified subsistence users would continue to employ ORVs for subsistence purposes throughout the TUA. This alternative provides a baseline for



evaluating the changes and impacts of the action alternatives. Additional information about existing conditions may be found in Chapter 3: The Affected Environment.

2.2.1 ORV Use Off-Trail

Off-trail ORV use would be allowed for all subsistence purposes by NPS qualified subsistence users throughout the Cantwell Traditional Use Area (TUA). There would be no limits on the types of ORVs that could be used.

2.2.2 ORV Use on Trails

ORV use on existing trails would continue to be allowed for all subsistence purposes by NPS qualified subsistence users throughout the TUA. There would be no limits on the types of ORVs that could be used.

2.2.3 ORV Use on the Bull River and Upper Cantwell Creek Floodplains

ORVs would be used for all subsistence purposes on the Bull River and Upper Cantwell Creek Floodplains. There would be no limits on the types of ORVs that could be used.

2.2.4 Closures

Although Departmental regulations (36 CFR 13.460(b)), give the park superintendent the authority to restrict or close a route or area if the superintendent determines that ORV use is or is likely to cause an adverse impact, for the purpose of analysis in this environmental assessment, no such management actions are predicted to occur under this No Action Alternative.

2.2.5 Harvest Limits

Under this alternative, the NPS would not seek to establish subsistence harvest limits for moose and caribou. Though this would not preclude establishing limits in the future if necessary to maintain or return moose and caribou populations to natural and healthy levels on park lands, for the purpose of analysis in this environmental assessment, no such management actions are predicted to occur under this No Action Alternative.

2.2.6 Degradation Levels

Having begun monitoring with the comprehensive survey of ORV use areas and impacts in 2005 (see Section 3.3.6), the NPS would continue to monitor the impacts of ORV use in the TUA (see Appendix 2). However, unlike under Alternatives 2, 3, and 4, the NPS would not establish specific degradation levels to aid in determining when management action is needed.

2.2.7 Zoning

The TUA would continue to be zoned “Management Area B” as prescribed in the 2006 Denali National Park and Preserve Backcountry Management Plan. The purpose of “Management Area B” is to provide opportunities for wilderness recreational activities suitable for day-users and overnight users that are remote and require self-reliance.

2.2.8 The 17 B Easement

The pre-existing 17B easement for public access across Ahtna Inc. property in the Windy Creek area near Cantwell would continue to be managed as it has in the past for the following uses: travel by foot, dogsleds, animals, snowmobiles, two- and three-wheel vehicles, and small all-terrain vehicles (ATVs) (less than 3,000 pounds gross vehicle weight) (See Section 1.6).

2.3 ALTERNATIVE 2

This alternative is based in part on recommendations made by the Denali Subsistence Resource Commission in its September 29, 1996, letter to the NPS (see Section 1.2). Under this alternative, the only off-trail ORV use permitted by NPS qualified subsistence users would be to retrieve harvested moose and caribou. In addition, use of ORVs by NPS qualified subsistence users engaged in subsistence activities would continue to be allowed on NPS-managed trails and routes (See Figures 2.2 and 2.3).

2.3.1 ORV Use Off-Trail

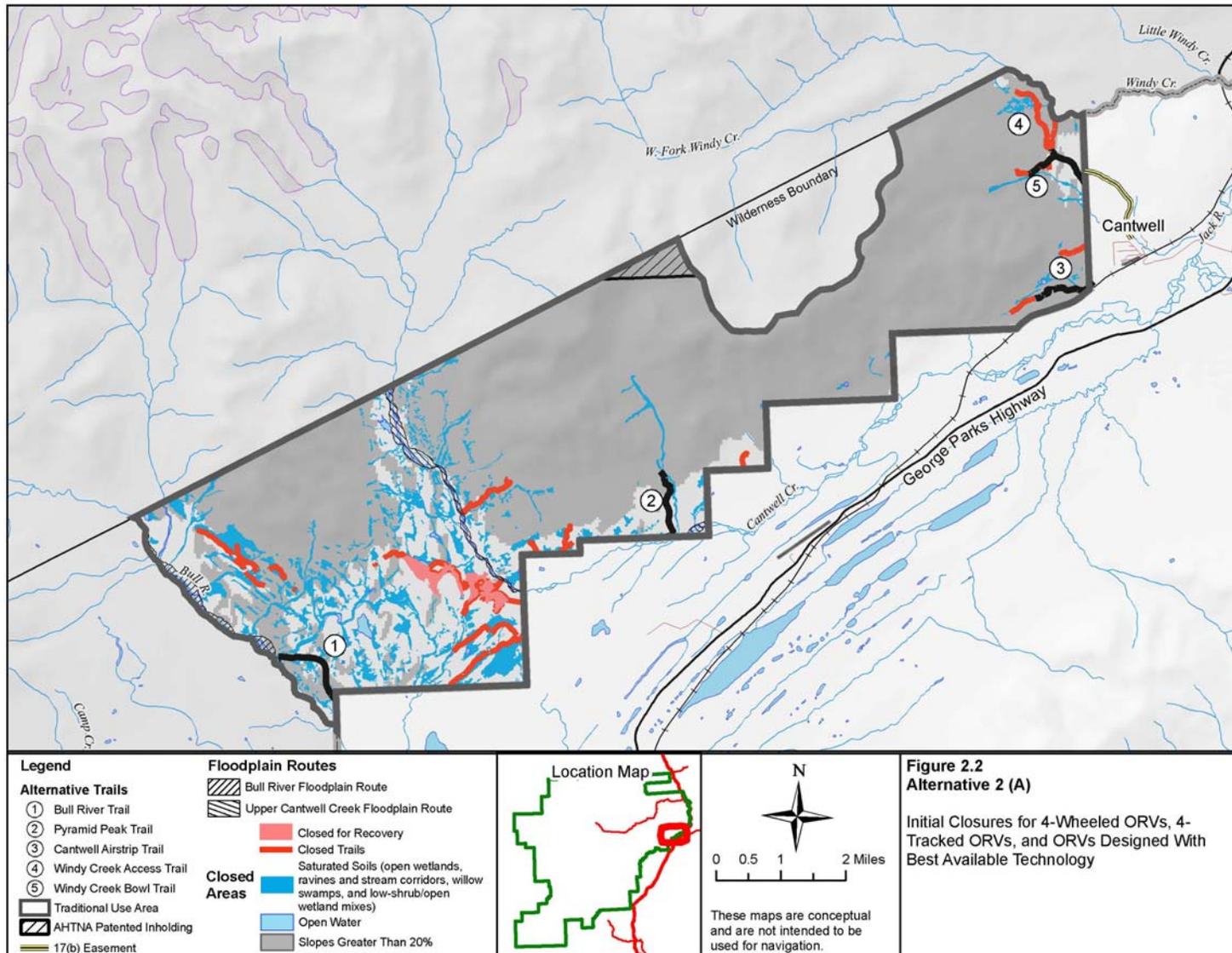
Within the Traditional Use Area (TUA), off-trail ORV use would be allowed only by permit for retrieval of harvested moose or caribou by NPS qualified subsistence users during the fall hunting season. ORVs could not be used in areas of the TUA that are closed for resource recovery or to protect sensitive habitat (see Section 2.3.4 below). In addition, hunters could continue to pack out harvested moose or caribou by foot, on dogsled, and with horses (including game carts).

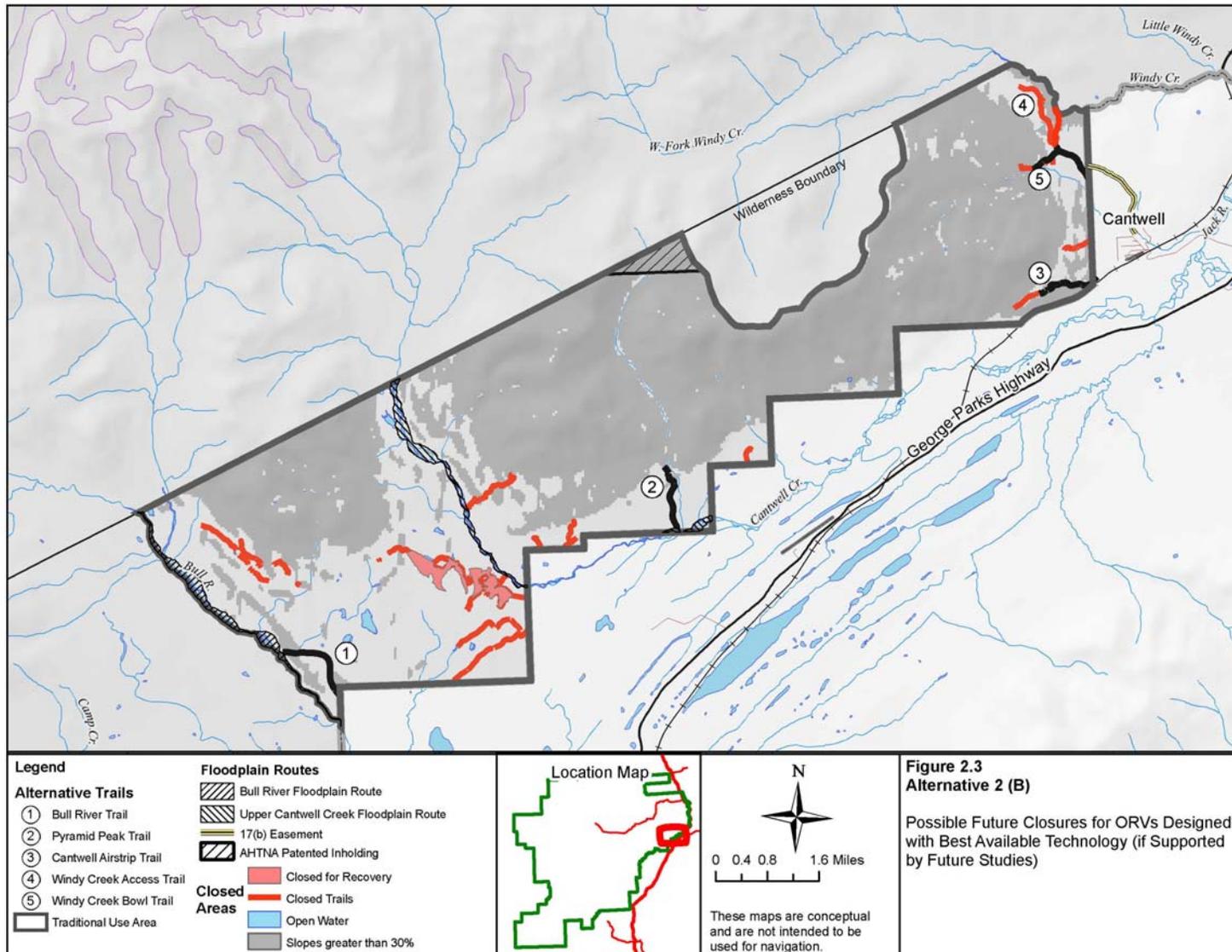
The types of ORVs that may be used for retrieval of harvested moose or caribou would be:

- (1) 4-wheel drive ORVs that are no wider than 5.5 feet, have a maximum gross weight of 1,000 pounds, have a maximum engine size of 500 cc, and have no aggressive lugged/paddle tires;
- (2) Track-equipped ORVs that are no wider than 5.5 feet, have a maximum gross weight of 1,000 pounds, have no-skid steering, and have a ground pressure of less than 1.0 pound per square inch (PSI); or
- (3) Other ORVs that have been designed with the best available technology and can be shown to have equivalent or fewer impacts than the 4-wheel drive and track-equipped vehicles described above.

Trailers must meet the same width standards and weight or PSI standards as the vehicle to which they're attached.

Subsistence users would be required to obtain a permit in advance from the NPS to use an ORV for off-trail retrieval of harvested moose or caribou. Retrieval permits would be issued by the NPS when a moose/caribou hunting permit is issued.





Travel guidelines or best practices would be provided with the permit and must be followed. For example, the NPS would require ORV turns to be gradual and occur at speeds less than 5 miles per hour; overland ORV travel speed would be limited to 10 miles per hour. Travel guidelines would also specify whether a single pass or multiple passes over the same route would be necessary to minimize impacts, depending on habitat type.

To aid the NPS in monitoring impacts of this off-trail use, the ORV user would be required to provide the NPS with a detailed map, a GPS-tracking log, or similar record identifying the travel path used for retrieval.

2.3.2 ORV Use on Trails

The following trails would be managed by the NPS for ORV use by NPS qualified subsistence users for all subsistence purposes:

- Windy Creek Access Trail;
- Windy Creek Bowl Trail;
- Cantwell Airstrip Trail;
- Pyramid Peak Trail; and
- Bull River Access Trail (new construction).

Use would be limited to any 4-wheel drive or tracked ORVs with a maximum width of 5.5 feet and a maximum gross vehicle weight limit of 1,000 pounds. To avoid impacting adjacent resources, there may be only one rolling vehicle at a time when ORVs pass each other along a trail.

Improvement of Existing NPS-Managed Trails

The NPS would implement management prescriptions to improve the existing Windy Creek Access Trail, Windy Creek Bowl Trail, Cantwell Airstrip Trail, and Pyramid Peak Trail (see Appendix 5 for details about the management prescriptions). The management prescriptions are treatments that respond to identified degraded conditions along the trail alignments in an effort to halt active erosion and treat severely degraded tread conditions. The management prescriptions are based on a draft framework for managing ORVs in Alaskan NPS units (see Appendix 4 for more information on the framework). The NPS would implement the management prescriptions as soon as possible, with the goal of actual funding and implementation within 1-4 years. Trail maintenance and improvements generally would occur along the existing alignment and trails would be no wider than six feet.

Bull River Access Trail Construction Details

The new Bull River Access Trail would extend approximately 8,500 linear feet from the park boundary to the Bull River Floodplain. The NPS would implement a specific management prescription in constructing the new Bull River Access Trail (see Appendix 5 for details). As with the existing NPS-managed trails, trail maintenance and improvements generally would occur along the constructed alignment and the trail would be no wider than six feet.

Trail construction would occur over one season and would require the following support facilities and equipment:

- A 7-person base camp;
- Approximately 12 trips using a small four-place helicopter and approximately two half-days' use of a six-place helicopter for mobilization/demobilization activities;
- A mini excavator or equivalent (e.g., Bobcat 334);
- All-wheel drive ORVs (400-500cc in size);
- ORV box trailers;
- ORV belly dump trailers; and
- A 2,500 watt generator.

2.3.3 ORV Use on the Bull River and Upper Cantwell Creek Floodplains

Both the Bull River and Upper Cantwell Creek Floodplains would be managed by the NPS for ORV use by NPS qualified subsistence users for all subsistence purposes. However, until the Bull River Access Trail was constructed, the floodplain of the Bull River would only be open to subsistence ORV use for retrieval of harvested moose or caribou.

The NPS would adhere to the following management guidelines for ORV use on the Bull River and Upper Cantwell Creek Floodplains:

- ORV travel alignments along vegetated sections of the floodplain would initially be marked. If monitoring shows unacceptable impacts, trail segments would be constructed.
- In general, floodplains would not be marked where the path from point A to point B is obvious and where there is no vegetation or sensitive resources.
- Any 4-wheel drive or tracked ORVs with a maximum width of 5.5 feet and a maximum gross vehicle weight limit of 1,000 pounds would be allowed on the floodplains.
- Vegetated areas adjacent to the floodplains would be closed to ORV use except as necessary for retrieval of harvested moose or caribou (see Section 2.3.1 above).

If construction of trail segments was warranted, the NPS would develop trail prescriptions, which could entail one or more of the following: brush clearing; surface blading; gravel capping, or other forms of hardening; cutting ramps on or off elevated bars; creating cross drainage; using techniques to prevent streams from following user-created channels; and flagging/markings.

Because of the dynamic floodplain landscape, the NPS would expect to mark floodplain routes annually. For the same reason, if trail segments were constructed, annual maintenance would be required to address such issues as: ramp washouts from high water events and channel migration; water flow along new alignments during high water events; erosion issues; loss of flagging/markers; and vegetation control.

The Bull River Floodplain Alignment

Figure 2.4 shows an estimated alignment for a Bull River Floodplain Trail/Route (note, this alignment is for analysis purposes only). The total length of the alignment would be about 4.5 miles, with more than 80% on unvegetated gravel bars and less than 10% on vegetated gravel bars or vegetated abandoned channels.

As noted above, if unacceptable impacts occur from ORV use along the vegetated portions of the alignment, constructed trail segments would be required. At most, such a trail would be required along about 10 % of the Bull River Floodplain alignment – or about half a linear mile. Although the NPS could find that actual ground conditions require less work, for the purpose of analysis in this EA it's assumed that the trail prescription would require blading and gravel fill or capping to create the trail. Gravel could be obtained from the active floodplain and transported to the trail via motorized equipment such as small bobcats with loader attachments. Another possible source of gravel would be beneath the trail alignment itself.

The estimated alignment indicates that there would be approximately 30 crossings of the main river channel and secondary channels. Crossings of tributary channels would be minimal.



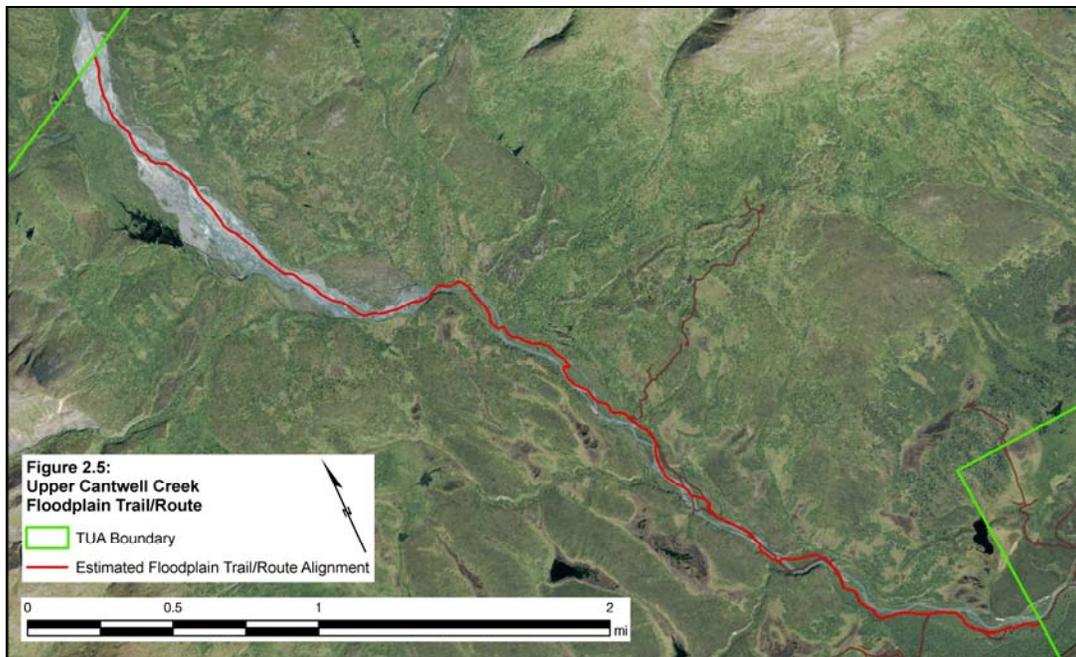
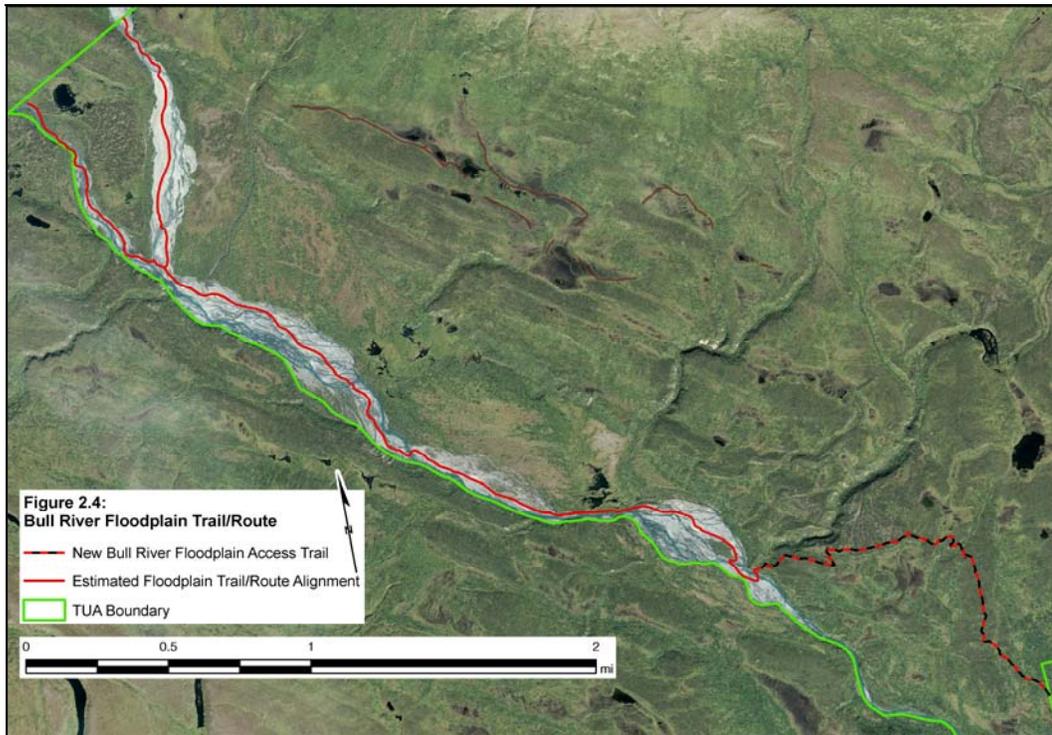
Photo 2.1 (left) – Lightly vegetated gravel bar. Photo 2.2 (right) – Floodplain with isolated non-vegetated gravel bars separated by willow shrublands, secondary channels, and wet swales. Both photos taken on Upper Cantwell Creek floodplain.

Upper Cantwell Creek Floodplain Alignment

Figure 2.5 shows an estimated alignment for an Upper Cantwell Creek Floodplain Trail/Route (as for the Bull River Floodplain, this alignment is for analysis purposes only). The total length of the route alignment would be about 4.5 miles, with about 50% on unvegetated gravel bars and about 45% on vegetated gravel bars or vegetated abandoned channels.

As noted above, if unacceptable impacts occur from ORV use along the vegetated portions of the alignment, constructed trails would be required. At most, such a trail would be required along about 45 % of the Upper Cantwell Creek Floodplain alignment – or about two linear miles. Although the NPS could find that actual ground conditions require less work, for the purpose of analysis in this EA it's assumed that the trail prescription would require blading and gravel fill or capping to create the trail. As with the Bull River Floodplain, gravel could be obtained from the active floodplain and transported to the trail via motorized equipment such as small bobcats with loader attachments. Another possible source of gravel would be beneath the trail alignment itself.

There would be approximately 35 crossings of the main river channel and secondary channels. Crossings of tributary channels would be minimal.



2.3.4 Closures

Under the authority of 36 CFR 13.460(b), the NPS would immediately close trails and areas within the TUA that currently exhibit unacceptable adverse impacts on park resources (“recovery closures”). These recovery closures would be closed to all ORV use. ORV use that is not consistent with NPS requirements and travel guidelines, and which causes new unacceptable adverse impacts, would be a citable offense and likely would result in closing any newly damaged area until it recovers. Although closures initially would be effected under 36 CFR 13.460(b), the NPS would initiate the necessary steps to promulgate the closures as a regulation.

ORV use would not be allowed during spring breakup conditions until the NPS determines that travel would not result in damage.

In addition, to prevent new adverse impacts from being created, the following areas would be permanently closed to ORVs traveling off NPS-managed trails or routes:

1. Open water (i.e., areas with equal to or greater than one inch of permanent standing water).
2. Slopes greater than 20%
3. Areas with saturated soils such the following vegetation covers: open wetlands, ravines and stream corridors, willow swamps, and low-shrub/open wetland mixes. (Note that other vegetation covers like willow or alder shrublands and spruce-willow/alder woodlands also have some saturated soils but these aren't included in this closure.)

Initially, under this alternative, 4-wheel drive ORVs, track-equipped ORVs, and ORVs designed with best available technology would be managed in the same manner and none would be allowed to travel in the closed areas just described. However, if future long-term studies find that ORVs designed with best available technology have minimal impacts on sensitive habitat or steeper slopes and that such impacts would be below the warning or action degradation levels proposed under this alternative (see Table 2.2), then they may be allowed across a wider area.

In the future, if ORV use must be limited, the NPS would give priority to use of ORVs for retrieval of harvested moose or caribou.

Signs indicating closure of the TUA to off-trail use would be posted and barriers (most likely split rail fencing) would be placed at the start of all trails that would now be closed under this alternative. In addition, the NPS would work to actively rehabilitate two closed trail sections to prevent ongoing degradation. Water control features and vegetative plugs would be used to rehabilitate the closed trail section that extends above the campsite at the end of the Windy Creek Bowl Trail and the closed section that extends from the Windy Creek Access Trail down to the Windy Creek ravine. Once rehabilitated, these trails would remain closed to ORV use.

2.3.5 Harvest Limits

The NPS would work with the Federal Subsistence Board, the Denali Subsistence Resource Commission, and the Regional Advisory Councils to establish subsistence harvest limits for moose and caribou as necessary to maintain natural and healthy moose and caribou populations on park lands.

The National Park Service would monitor wolf harvest records from the TUA. If there were any indication of a substantial increase that would affect segments of the population, the NPS would take appropriate management action, which could include proposing a harvest limit.

2.3.6 Degradation Levels

Monitoring provides information about the impact of ORV use on park resources (see Appendix 2 for monitoring strategies under this alternative). When this information shows that resource degradation is moving toward unacceptable levels or is already at such levels, management action would be taken.

Under this alternative, two levels of degradation would be established: warning levels and action levels.

- Warning Levels indicate that conditions are deteriorating and managers would be advised to take action but wouldn't be required to do so.
- Action Levels indicate that impacts have already reached unacceptable levels and managers would take immediate management action to remedy the situation.

Warning and action levels differ depending on whether they're associated with trails, routes and off-trail areas, or with all three. Tables 2.1 and 2.2 present preliminary sets of potential warning and action degradation levels for several indicator categories. While these would define levels for individual impacts, the following action levels would be established for collective impacts:

1. For impacts identified along a trail, managers would take immediate action if the sum of the trail segment lengths (in linear meters) at warning or action levels exceeds 15% of the total trail length.
2. For impacts identified in off-trail areas and routes, beginning in 2009 or 2010 (when impacts would become apparent), managers would take immediate action if visible/detectable degraded conditions, even those that are below the warning levels, are accumulating within the Traditional Use Area faster than impacts are recovering. In other words, there should be no net gain in degradation over what was identified in the 2005 inventory.

As noted, all of these degradation levels are preliminary. To confirm these levels, they must be field-tested, which may result in modifications.

Management Tools to Respond to Degradation Levels

Table 2.3 lists the tools that may be used to manage access when necessary in response to conditions reaching warning or action degradation levels. These tools are arranged in rough order from the least restrictive to the most restrictive. The park superintendent would be free to pick whichever tool is required as long as the "least restrictive" criterion is heeded. There would be no implication that the tools must be tried in the listed order and a failure elicited before trying the next one.

2.3.7 Zoning

During the summer and fall seasons, the Windy Creek Access Trail, Windy Creek Bowl Trail, Cantwell Airstrip Trail, Pyramid Peak Trail, Bull River Access Trail, and the NPS-managed trails and routes within the Bull River and Upper Cantwell Creek Floodplains all would be rezoned

Table 2.1 Degradation Levels for the TUA (Except the Upper Cantwell Creek and Bull River Floodplains Which Are Covered By A Separate Set of Degradation Levels).

CATEGORY	WARNING DEGRADATION LEVELS	ACTION DEGRADATION LEVELS
Trail Width		
Trails	Trail width exceeds design width specifications or original construction by greater than 20% of width necessary for passage of class of vehicle using it.	Trail width exceeds design width specifications or original construction by greater than 30% of width necessary for passage of class of vehicle using it
Routes and Off-Trail Areas	N/A	N/A
Trails, Routes, and Off-Trail Areas	N/A	N/A
Multiple Passes		
Trails	N/A	Evidence of multiple parallel passes
Routes and Off-Trail Areas	N/A	Evidence of multiple parallel passes that persist for years.
Trails, Routes, and Off-Trail Areas	N/A	N/A
Soil Organic Mat Disruption		
Trails	Disruption of the soil organic mat on off-trail areas; e.g., from vehicle passing or other operation off of the main, modified trail surface onto saturated soils.	Disruption, removal, or perforation of organic mat off-trail that persists for more than one season on any segment of 3 meters or more.
Routes and Off-Trail Areas	Perforation or removal of organic mat totaling 15% of any 10 meter segment.	Perforation or removal of organic mat persists for more than one season totaling 50% of any 5 meter segment.
Trails, Routes, and Off-Trail Areas	N/A	N/A
Slope Class		
Trails	N/A	N/A
Routes and Off-Trail Areas	N/A	Pass alignment grade is at or greater than 20% for four-wheeled ORVs or other ORVs not designed with BAT and at or greater than 30% for ORVs designed with BAT
Trails, Routes, and Off-Trail Areas	N/A	N/A
Soil Compaction		
Trails	Wheel ruts, track depressions, or any other sort of trail surface compaction have depressed the trail surface between 2 and 6 inches below the surrounding soil surfaces and these impacts persist year to year along 50% of any 10 meter or longer section of trail.	Wheel ruts, track depressions, or any other sort of trail surface compaction have depressed the trail surface greater than 6 inches below the surrounding soil surfaces and these impacts persist year to year along 50% of any 10 meter or longer section of trail <i>and</i> these impacts have the potential to get worse because there is no underlying mineral or well-drained soil.
Routes and Off-Trail Areas	Visible ruts persist from year to year that are between 2 and 3 inches along 50% of any 10 meter or longer pass.	Visible ruts persist from year to year that are greater than 3 inches deep along 50% of any 10 meter or longer pass.
Trails, Routes, and Off-Trail Areas	N/A	N/A

CATEGORY	WARNING DEGRADATION LEVELS	ACTION DEGRADATION LEVELS
Soil Erosion		
Trails	N/A	N/A
Routes and Off-Trail Areas	Exposed soils along 15% of any 10 meter or longer pass.	N/A
Trails, Routes, and Off-Trail Areas	N/A	Any evidence of active transport erosion along 25% of any 10 meter or longer section of trail or pass.
Mud-Muck		
Trails	Trail surface has a thick surface of mud greater than 2 inches deep.	Trail surface has a thick surface of mud greater than 8 inches deep. The alignment is seasonally impassable due to severely degraded conditions. The alignment is impassable at all times due to severely degraded conditions.
Routes and Off-Trail Areas	N/A	N/A
Trails, Routes, and Off-Trail Areas	N/A	Any large, single, deep water and mud filled hole or depression that alters travel. Two or more adjacent or nearly continuous muck holes, still passable by ORVs.
Persistent Drainage		
Trails	N/A	N/A
Routes and Off-Trail Areas	N/A	N/A
Trails, Routes, and Off-Trail Areas	Standing water along alignment over organic or fine textured soils during normal weather conditions (ponding).	Modifications in surface hydrology occurring, such stream capture, or such as water running along the surface of the trail/pass in sufficient quantity to cause erosion (see Soil Erosion above).
Stoniness		
Trails	Between 10% and 25% of the trail surface has large stones that hinder travel.	More than 25% of the trail surface has large stones that hinder travel.
Routes and Off-Trail Areas	N/A	N/A
Trails, Routes, and Off-Trail Areas	N/A	N/A
Stream Sedimentation		
Trails	N/A	N/A
Routes and Off-Trail Areas	N/A	N/A
Trails, Routes, and Off-Trail Areas	Evidence of persistent sedimentation immediately below an ORV stream crossing (soft-substrate streams only).	Evidence of persistent sedimentation 20 meters or more below an ORV stream crossing (soft-substrate streams only).

Table 2.2 Degradation levels for Upper Cantwell Creek and Bull River Floodplains.

CATEGORY	WARNING DEGRADATION LEVELS	ACTION DEGRADATION LEVELS
Trail Width	Any developed trail segment crossing and stripping vegetation what exceeds 83 inches (1.5 times the necessary width to pass permitted sized vehicles).	Any developed trail segment crossing and stripping vegetation that exceeds 110 inches (2 times the necessary width the pass permitted vehicles).
Multiple Passes	Evidence of more than 2 multiple passes through a vegetated area that has stripped live foliage but not stripped vegetation to the ground surface on more than one trail alignment.	Evidence of more than 2 multiple passes through a vegetated area that has stripped vegetation to the ground surface.
Soil Organic Mat Disruption	A secondary alignment through a vegetated area that has the potential of stripping vegetation to the ground surface.	More than one alignment through a vegetated area that has stripped vegetation to the ground surface.
Slope Class	Any trail segment within 25 feet of a receiving water body traversing a slope >10% or a cut bank with a >10% grade.	Any trail segment traversing a slope or steep cut bank that is eroding and causing significant sediment discharge into receiving waters.
Soil Compaction	None	None
Soil Erosion	Any trail segment that is eroding and has the potential of causing significant sediment discharge into receiving waters.	Any trail segment that is eroding and causing significant sediment discharge into receiving waters.
Mud-Muck	Any trail segment that has developed a muddy surface >2 inches thick that has the potential of a significant discharge into receiving waters.	Any trail segment that has developed a muddy surface > 2 inches thick that is actively discharging significant sediment into receiving waters.
Persistent Drainage	None	Water activity running along a created trail alignment through a vegetated section (stream capture)None, unless it leads to another listed action degradation level.
Stoniness	None	W
Stream Sedimentation	Evidence of persistent sedimentation immediately below an ORV stream crossing (soft-substrate streams only).	Evidence of persistent sedimentation 20 meters or more below an ORV stream crossing (soft-substrate streams only).

from “Management Area B” to “Corridor.” The purpose of the Corridor management area is to provide for high-use travel via ground or water accessing remote parts of the park and preserve.

2.3.8 The 17 B Easement

The pre-existing 17B easement for public access across Ahtna Inc. property in the Windy Creek area near Cantwell would continue to be managed as it has in the past, including restricting the maximum gross vehicle weight on this trail to 3,000 pounds. In addition, the NPS would take action to improve the easement by implementing a specific set of management prescriptions (see Appendix 5 for details about the management prescriptions). The NPS would implement the management prescriptions as soon as possible, with the goal of actual funding and implementation within 1-4 years.

Table 2.3 Management tools that may be used to manage access in response to conditions reaching warning or action degradation levels

1) Education	The National Park Service would provide printed material, public presentations, targeted presentations to user groups, and Internet-based programs, with the goal of actively involving visitors in helping the park achieve the standards for all management areas.
2) Increased enforcement of existing regulations	The National Park Service would prioritize enforcement of existing regulations to assist in achieving standards for management areas.
3) Voluntary restrictions	The National Park Service would ask ORV users to restrict their use voluntarily. Examples of such measures could include: voluntary registration; use of low-impact equipment; avoidance of certain areas of the TUA; or avoidance of areas during particular seasons or weather conditions. Voluntary registration would not require a permit and could be accomplished by trailhead register, phone or radio call-in, or the Internet.
4) Required registration	The National Park Service would require ORV users to register. ORV users would be issued a permit that provides information about park rules and conditions for use necessary to protect park resources. Permit conditions could include minimum impact travel requirements and resource protection requirements; however, a registration process would not limit the number of ORV users or the type or amount of access.
5) Technology requirements or other requirements governing means of access	To achieve management area standards, the National Park Service would place requirements on the types of ORVs used.
6) Regulate numbers of ORVs or the number of ORV passes	The National Park Service would establish quotas for ORV numbers or passes in areas of the TUA when the volume of use is high enough that other mechanisms are unlikely to achieve standards. ORV users would be required to register and carry a permit, and the number of available permits would be limited.
7) Temporal restrictions	The National Park Service would restrict access to particular times of year based upon surface conditions, or the duration of access could be limited.
8) Temporary and permanent closures	Using the appropriate authorities, the National Park Service would temporarily or permanently close areas of the park and preserve to all types of visitor use or to specific types of access until conditions stabilize or recover.
9) Physical mitigation measures	Develop and implement mitigation measures to reduce environment and use impacts. For instance, rolling grade dips could be installed to control erosion, short sections could be hardened, climbing turns could be integrated to lower over-steepened grades, or short sections of trails could be re-routed around sensitive sites.

2.4 ALTERNATIVE 3 (NPS Preferred Alternative)

The Cantwell Traditional Use Area (TUA) would remain open to use of ORVs by NPS qualified subsistence users for all subsistence purposes only on NPS-managed trails and routes. In addition, the NPS would work with the Federal Subsistence Board and others to implement a winter subsistence moose hunt (See Figure 2.6).

2.4.1 ORV Use Off-Trail

There would be no off-trail use of ORVs for subsistence or any other purposes within the TUA. Instead, the NPS would work with the Federal Subsistence Board, the Denali Subsistence Resource Commission, and the Regional Advisory Councils to implement a winter subsistence moose hunt, primarily in the area southwest of Cantwell Creek and into the Bull River area. Winter in this context means the time of year when the ground is frozen and there's adequate snow cover for snowmachine use. The winter hunt likely would be open until harvest limits are reached. In addition, hunters could continue to pack out harvested moose or caribou by foot, on dogsled, and with horses, including game carts.

2.4.2 ORV Use On Trails

As described for Alternative 2, the following trails would be managed by the NPS for ORV use by NPS qualified subsistence users for all subsistence purposes:

- Windy Creek Access Trail;
- Windy Creek Bowl Trail;
- Cantwell Airstrip Trail;
- Pyramid Peak Trail; and
- Bull River Access Trail (new construction).

These NPS-managed trails would be treated the same as described under Alternative 2 (see Section 2.3.2).

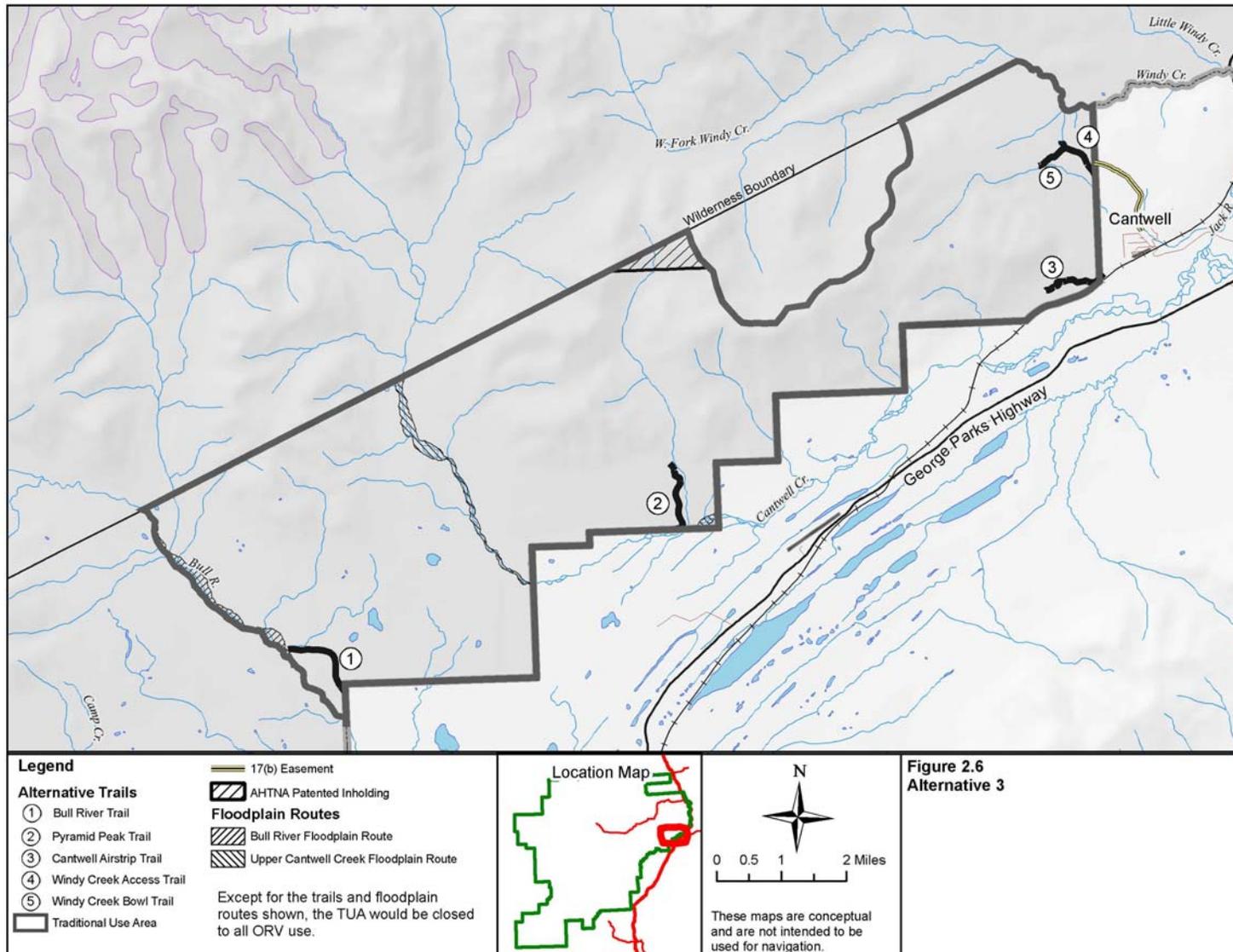
2.4.3 ORV Use On the Bull River and Upper Cantwell Creek Floodplains

As described under Alternative 2, both the Bull River and Upper Cantwell Creek Floodplains would be managed by the NPS for ORV use by NPS qualified subsistence users for all subsistence purposes (see Section 2.3.3). However, unlike under Alternative 2, vegetated areas adjacent to the floodplains would be closed to all ORV use (see Section 2.4.1).

2.4.4 Closures

Areas off of NPS-managed trails and routes would be closed by regulation to ORV use, including the "recovery closures" as described under Alternative 2.

ORV use would not be allowed during spring breakup conditions until the NPS determines that travel would not result in damage.



In the future, if subsistence ORV use must be limited even on the NPS-managed trails and routes, the NPS would give priority to using ORVs along these trails and routes in order to get closer to harvested moose or caribou and facilitate their retrieval.

Signs indicating closure of the TUA to off-trail use would be posted and barriers (most likely split rail fencing) would be placed at the start of all trails that would now be closed under this alternative. In addition, the NPS would work to actively rehabilitate two closed trail sections to prevent ongoing degradation: water control features and vegetative plugs would be used to rehabilitate the closed trail section that extends above the campsite at the end of the Windy Creek Bowl Trail and the closed section that extends from the Windy Creek Access Trail down to the Windy Creek ravine. Once rehabilitated, these trails would remain closed to ORV use.

2.4.5 Harvest Limits

Potential harvest limits for moose, caribou, and wolves would be the same as described under Alternative 2.

2.4.6 Degradation Levels

Degradation levels would be the same as described under Alternative 2.

2.4.7 Zoning

Zoning changes would be the same as described under Alternative 2,

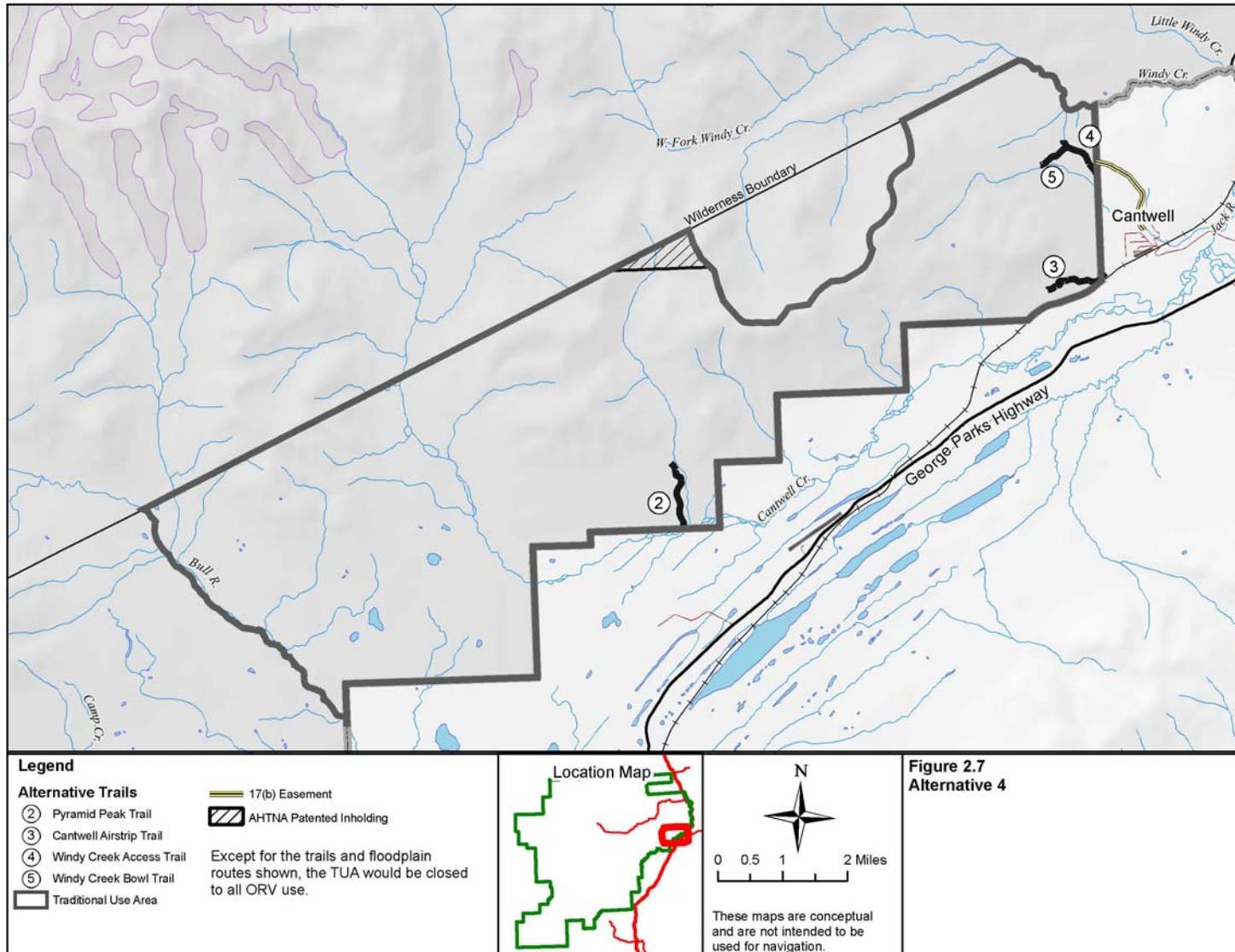
2.4.8 The 17 B Easement

The 17B Easement would be managed as described under Alternative 2.

2.5 ALTERNATIVE 4

Alternative 4 would be similar to Alternative 3, except for the following differences:

1. The NPS would not construct the new Bull River Access Trail.
2. ORVs would not be authorized on either the Bull River or Upper Cantwell Creek Floodplains.
3. The NPS would authorize ORV use for subsistence purposes only on the
 - a. Windy Creek Access Trail,
 - b. Windy Creek Bowl Trail,
 - c. Cantwell Airstrip Trail, and the
 - d. Pyramid Peak Trail.
4. ORV use for subsistence purposes would be authorized on these four trails *only* from one week before the beginning of the fall moose and caribou hunting seasons until the end of these hunting seasons.
5. During the summer and fall seasons, these four trails would be rezoned from “Management Area B” to “Corridor.”



2.6 MITIGATING MEASURES

Fish Habitat: On the Upper Cantwell Creek and the Bull River Floodplains, the NPS would conduct a fish inventory of the river channels and tributaries to determine the presence of fish and related spawning and rearing habitat. If necessary, water crossings would be marked to ensure they are in appropriate places to minimize sedimentation and avoid spawning areas.

Cultural Resources: If cultural resources were discovered during ORV trail maintenance, improvement, or construction activities, the site would be protected and the activities would stop until the park archeologist can be notified and has the opportunity to evaluate the site.

Migratory Birds: 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).

Rare Plants: *Botrychium alaskaense* occurs in river flats in the vicinity of the Traditional Use Area of Denali National Park, and thus surveys for this taxon along Cantwell Creek and Bull River should be performed before choosing a designated route through this area.

2.7 ENVIRONMENTALLY PREFERRED ALTERNATIVE

As stated in Section 2.7 (D) of the NPS DO-12 Handbook, "The environmentally preferred alternative is the alternative that will best promote the national environmental policy expressed in NEPA (Section 101(b))." The environmentally preferred alternative is the alternative that not only results in the least damage to the biological and physical environment, but that also best protects, preserves, and enhances historic, cultural, and natural resources.

Alternative 4 is the environmentally preferred alternative because it would have the fewest impacts to the biological and physical environment; however, it would have the greatest impact on cultural and traditional use patterns.

2.8 ALTERNATIVES AND ACTIONS CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

Several alternatives were considered during the public and agency scoping process but were eliminated from further evaluation in this EA. This section describes the alternatives and actions that were considered and provides justification for their elimination.

2.8.1 No Limits on ORV Type for Moose/Caribou Retrieval. This proposal would be the same as Alternative 2, except the NPS would not place restrictions on the types of ORVs used to retrieve harvested moose or caribou. This alternative was eliminated because it would not meet

the specific project purpose (see Section 1.1), specifically minimizing adverse impacts to the resources and values for which the park was established.

2.8.2 Manage All Existing Trails for Continued ORV Use. This action would require maintaining or improving all of the existing ORV trails in the TUA. This action was dismissed because many of these trails are duplicative or are too heavily impacted and need to be closed for recovery.

2.8.3 Reconsider Resident Zone Status of Cantwell. This action would re-examine the resident zone status of Cantwell. Under this action, the resident zone could be replaced by a system of individual subsistence use permits for those residents who have customarily and traditionally engaged in subsistence uses in the park without using aircraft as a means of access. This proposal would not significantly change the present need to manage, or change the impacts from, use of ORVs by qualified subsistence users in the TUA. It also would require a lengthy regulatory process with an uncertain outcome.

2.8.4 Include Dunkle Hills in the Cantwell Traditional Use Area. The decision to exclude the Dunkle Hills from the Cantwell TUA was made as part of the *2005 Cantwell Subsistence Traditionally Employed ORV Final Determination*. No additional facts have been revealed which would change that decision. Additionally, reconsidering that decision is outside the scope of this EA.

2.8.5 Allow ORV Use Only on NPS-managed Trails When There's Adequate Ground Frost To Support the Vehicles Without Causing Impacts to Soils or Water Quality. Given the standard snow regime on the south side of the Alaska Range (including the TUA), there is no time when there is frost on the ground but no snow on the ground. For this reason, this action was not considered fully in the EA.

2.8.6 ORV Access Allowed, But Limited to the Same Number of ORV Users as in 1980. This option was not fully evaluated, because there is too much uncertainty about the correlation between 1980 ORV use levels within the TUA and potential resource damage. Therefore, to limit the use levels to this number would be an arbitrary decision.

2.8.7 Close Entire Traditional Use Area to ORVs. This alternative was considered and analyzed in the NPS internal review draft EA; however, it was eliminated from further study because it does not fulfill the specific project purpose (see Section 1.1), specifically providing reasonable access for subsistence purposes.

2.8.8 Allow ORV Use As Described in the Temporary Closure. This alternative would make permanent the actions described in the 120-day temporary closures implemented by the NPS in August 2005 and August 2006. The entire TUA would be closed to ORVs, except 1) the one mile long Windy Creek Trail from the park boundary to the top of the ravine leading down to Windy Creek, including the 0.5 mile long spur trail that leads to the west/southwest from the ravine; 2) the northern portion of the old roadbed that extends southwest from the Cantwell Airstrip, for approximately one mile to the top of a little knoll; and 3) the Cantwell Creek Trail, which encompasses the gravelly part of the floodplain of Cantwell Creek for about 3 1/4 miles within the park downstream of the wilderness boundary, including the section that re-enters the park near Pyramid Peak. This alternative was eliminated from further consideration because similar actions are evaluated fully in the action alternatives.

Table 2.4 Summary of Alternatives

	Alternative 1 (No Action)	Alternative 2	Alternative 3 (NPS Preferred Alternative)	Alternative 4
Summary	Entire TUA open to ORV use by NPS qualified subsistence users for all subsistence purposes.	TUA open to off-trail ORV use by NPS qualified subsistence users only by permit for retrieval of subsistence harvested moose or caribou and for all subsistence purposes on the new Bull River Access Trail and on NPS-managed trails and routes, including those within the Bull River and Upper Cantwell Creek Floodplains. Certain closures would apply.	TUA open to ORV use by NPS qualified subsistence users for all subsistence purposes <i>only</i> on the new Bull River Access Trail and on NPS-managed trails and routes, including those within the Bull River and Upper Cantwell Creek Floodplains. Certain closures would apply. Possible winter subsistence moose hunt.	Same as Alternative 3, except the NPS would not construct the new Bull River Access Trail or allow ORV use on either the Bull River or Upper Cantwell Creek Floodplain. Additionally, the NPS would authorize ORV use for subsistence purposes on NPS-managed trails <i>only</i> from one week before the beginning of the fall moose and caribou hunting seasons through to the end of these hunting seasons.
ORV Use Off-Trail in the TUA	<ul style="list-style-type: none"> Allowed for all subsistence purposes by NPS qualified subsistence users. No limits on ORV types. 	<ul style="list-style-type: none"> Only by permit (with conditions) for retrieval of moose or caribou harvested by NPS qualified subsistence users (except closures) ORV types limited to: (1) 4-wheel drive ORVs that are < 5.5 feet wide, < 1,000 pounds maximum gross weight, < 550 cc maximum engine size, and have no aggressive lugged/paddle tires; (2) track-equipped ORVs that are < 5.5 feet wide, < 1,000 pounds maximum gross weight, < 1.0 ground psi, and have no-skid steering; or (3) Other ORVs designed with best available technology and shown to have equal or fewer impacts than the 4-wheel drive or track-equipped ORVs described above. 	<ul style="list-style-type: none"> No off-trail use of ORVs for subsistence or any other purposes NPS would work with Federal Subsistence Board, the Denali Subsistence Resource Commission, and the Regional Advisory Councils to implement a winter subsistence moose hunt, primarily in the area southwest of Cantwell Creek and into the Bull River area 	<ul style="list-style-type: none"> Same as Alternative 3.
ORV Use On Trails	<ul style="list-style-type: none"> Allowed for all subsistence purposes by NPS qualified subsistence users on any existing trail. No limits on ORV types. 	<ul style="list-style-type: none"> Allowed for all subsistence purposes by NPS qualified subsistence users only on NPS-managed existing trails: Windy Creek Access Trail; Windy Creek Bowl Trail; Cantwell Airstrip Trail Allowed on newly constructed Bull River Access Trail. 4-wheel drive or tracked ORVs that are < 5.5 feet wide and < 1,000 pounds maximum gross vehicle weight 	<ul style="list-style-type: none"> Same as Alternative 2. 	<ul style="list-style-type: none"> Same as Alternative 2, except: <ul style="list-style-type: none"> The NPS would not construct the new Bull River Access Trail The NPS would authorize ORV use for subsistence purposes on NPS-managed trails <i>only</i> from the week before the beginning of the fall moose and caribou hunting seasons to the end of these seasons.
ORV Use on the Bull River and Upper Cantwell Creek Floodplains	<ul style="list-style-type: none"> Allowed for all subsistence purposes by NPS qualified subsistence users. No limits on ORV types. 	<ul style="list-style-type: none"> Allowed for all subsistence purposes by NPS qualified subsistence users on NPS-managed trails and routes. ORV types limited to 4-wheel drive or tracked ORVs that are < 5.5 feet wide and < 1,000 pounds maximum gross vehicle weight 	<ul style="list-style-type: none"> Same as Alternative 2. 	<ul style="list-style-type: none"> ORV use on the Bull River and Upper Cantwell Creek floodplains would not be authorized.
Closures	<ul style="list-style-type: none"> No immediate closures. Departmental regulations give the park superintendent authority to close or restrict a route or area to ORV use; however, for the purpose of analysis in this EA, no such management actions are predicted to occur under this No Action Alternative. 	<ul style="list-style-type: none"> Immediate closure of certain areas and trails for recovery No ORV use during spring breakup conditions until NPS allows. Off-trail: no ORV travel allowed across open water, on slopes greater than 20%, or across areas with saturated soils such as open wetlands, ravines and stream corridors, willow swamps, and low-shrub/open wetland mixes. If future studies find minimal impacts, then ORVs designed with best available technology may be allowed to travel across a wider area. In the future, if ORV use must be further limited, priority given to use of ORVs on NPS-managed trails and routes only to facilitate retrieval of harvested moose or caribou All areas and trails closed for recovery would be posted with closure signs and barriers would be placed at the start of the closed trail sections The NPS would work to actively rehabilitate two closed trail sections to prevent ongoing degradation. Once rehabilitated, these trails would remain closed to ORV use. 	<ul style="list-style-type: none"> Same as Alternative 2, except all areas off of NPS-managed trails and routes would be closed by regulation to ORV use, including the “recovery closures” as described under Alternative 2. 	<ul style="list-style-type: none"> Same as Alternative 3, except ORV use on the Bull River and Upper Cantwell Creek Floodplains would not be authorized.
Subsistence Harvest Limits	<ul style="list-style-type: none"> No immediate limits. Though future limits could be established, for the purpose of analysis in this EA, no such management actions are predicted to occur under this No Action Alternative. 	<ul style="list-style-type: none"> The NPS would work with the Federal Subsistence Board, the Denali Subsistence Resource Commission, and the Regional Advisory Councils to establish subsistence harvest limits for moose and caribou as necessary to maintain natural and 	<ul style="list-style-type: none"> Same as Alternative 2 	<ul style="list-style-type: none"> Same as Alternative 2

	Alternative 1 (No Action)	Alternative 2	Alternative 3 (NPS Preferred Alternative)	Alternative 4
		<p>healthy populations on park lands.</p> <ul style="list-style-type: none"> The NPS would monitor wolf harvest records from the TUA. If there were any indication of a substantial increase that would affect segments of the population, the NPS would take appropriate management action, which could include proposing a harvest limit. 		
Degradation Levels	<ul style="list-style-type: none"> Monitoring would continue. No degradation levels would be established. 	<ul style="list-style-type: none"> Monitoring would continue. When monitoring shows that resource degradation is moving toward unacceptable levels or is already at such levels, management action would be taken. 	<ul style="list-style-type: none"> Same as Alternative 2 	<ul style="list-style-type: none"> Same as Alternative 2.
Zoning	<ul style="list-style-type: none"> The TUA would continue to be zoned as “Backcountry Management Area B” 	<ul style="list-style-type: none"> During the summer and fall seasons, the Windy Creek Access Trail, Windy Creek Bowl Trail, Cantwell Airstrip Trail, Pyramid Peak Trail, Bull River Access Trail, and the NPS-managed trails and routes within the Bull River and Upper Cantwell Creek Floodplains all would be rezoned from “Management Area B” to “Corridor.” 	<ul style="list-style-type: none"> Same as Alternative 2. 	<ul style="list-style-type: none"> During the summer and fall seasons, the Windy Creek Access Trail, Windy Creek Bowl Trail, Cantwell Airstrip Trail, and the Pyramid Peak Trail would be rezoned from “Management Area B” to “Corridor.”
The 17B Easement	<ul style="list-style-type: none"> Managed as it has in the past for the following uses: travel by foot, dogsleds, animals, snowmobiles, two- and three-wheel vehicles, and small all-terrain vehicles (ATVs) (less than 3,000 pounds gross vehicle weight). 	<ul style="list-style-type: none"> Managed as in the past, but improved by implementing specific management prescriptions to respond to identified degraded conditions. 	<ul style="list-style-type: none"> Same as Alternative 2. 	<ul style="list-style-type: none"> Same as Alternative 2.

Table 2.5 Summary of Impacts from Alternatives

	Alternative 1 (No Action)	Alternative 2	Alternative 3 (NPS Preferred Alternative)	Alternative 4
Level of NEPA Documentation Needed to Select Alternative	Because this alternative would have major adverse impacts, an Environmental Impact Statement is required to implement this alternative.	Because this alternative would have major adverse impacts, an Environmental Impact Statement is required to implement this alternative.	Because this alternative would not result in major adverse impacts, the NPS could select this alternative with a Finding of No Significant Impact (FONSI) and no Environmental Impact Statement is required.	Because this alternative would not result in major adverse impacts, the NPS could select this alternative with a Finding of No Significant Impact (FONSI) and no Environmental Impact Statement is required.
Soils	<p>Actions in this alternative would have a major adverse impact on soils in the Cantwell TUA because of intense, long-term ORV use in many areas of the TUA. Those soils would be affected by direct effects such as churning and rutting, and from secondary effects such as erosion. Over the long term, the level of impacts to soils could result in degradation of soils on significant areas within the 32,159 acres of the TUA. Most impacts probably would occur on the 2,900 acres of flat (i.e., less than 20% slope) and open terrain that's most easily accessed by ORVs.</p> <p>The level of impacts to soils anticipated from this alternative would result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or that are key to the integrity of the park.</p>	<p>Actions in this alternative would have a moderate impact on soils in the Cantwell TUA because of widespread long-term ORV use in many areas of the TUA. An estimated 51 to 959 acres of new off-trail impacts to soils would occur over 15 years, depending on the types of landscapes driven through. Impacts would include churning and rutting, as well as erosion. In addition to these impacts, soils would be directly affected by construction on 1.7 acres for the new Bull River Access Trail, another 2.0 acres to maintain trails through the Bull River and Upper Cantwell Creek Floodplains, and by continued use on 5.8 acres of the four trails retained. NPS trail construction, maintenance and reinforcement activities, coupled with the more intensive monitoring included in this alternative, would minimize some of the potential soil impacts, especially the indirect impacts. As a result, overall soils impacts under this alternative are expected to be moderate.</p> <p>The level of impacts to soils anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or that are key to the integrity of the park.</p>	<p>Actions in this alternative would have a moderate impact on soils in the Cantwell TUA because soils would be directly affected by construction on 1.7 acres for the new Bull River Access Trail, another 2.0 acres to maintain trails through the Bull River and Upper Cantwell Creek Floodplains, and by continued use on 5.8 acres of the four trails retained. NPS trail construction, maintenance and reinforcement activities, coupled with the more intensive monitoring included in this alternative, would minimize some of the potential soil impacts, especially the indirect impacts.</p> <p>The level of impacts to soils anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or that are key to the integrity of the park.</p>	<p>Actions in this alternative would have a minor impact on soils in the Cantwell TUA. Soils would be directly affected by continued use of ORVs on 5.8 acres of the four trails retained. NPS management of trail construction, maintenance and reinforcement activities, coupled with the more intensive monitoring included in this alternative, would minimize some of the potential soil impacts, especially the indirect impacts.</p> <p>The level of impacts to soils anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified.</p>
Vegetation (Including Wetlands)	<p>Alternative 1 would have a major adverse impact on vegetation and wetlands because of widespread, intense, long-term ORV use in many areas of the TUA. Given that that ORV use in the TUA would increase, negative impacts to previously non-impacted lands could be widespread and common. Over the long term vegetation could be adversely impacted throughout the 32,159 acre TUA. However, most impacts probably would occur on the 2,900 acres of flat and open terrain composed of open wetlands, low shrub-open wetland mix, tussock meadows, open gravel floodplains, lightly vegetated gravel bar, open water, and upland and alpine meadows. This 2,900 acres of impact includes approximately 2,314 acres of wetland impacts.</p> <p>The level of impacts to vegetation and wetlands anticipated from this alternative would result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or that are key to the integrity of the park.</p>	<p>Under Alternative 2, adverse impacts on vegetation and wetlands would be major. Trail construction, improvement, and maintenance would adversely impact a total of 10.7 acres of primarily dwarf birch shrublands, spruce-willow/alder woodlands, willow floodplain type wetlands, successional herbaceous vegetation, and willow shrub floodplain vegetation. This total includes about 1.5 acres of wetlands. In addition, approximately 250 acres of open gravel bar and water channels could be impacted by ORV operators traveling along the Upper Cantwell Creek and Bull River Floodplain routes.</p> <p>Off-trail ORV use for retrieval of harvested moose and caribou could impact from 51 acres to 959 acres. The 51 acre estimate represents a scenario with primarily low intensity impacts resulting from short retrieval routes (½ mile one-way) that cross vegetation types that for the most part recover from ORV impacts within 2 to 5 years (e.g., wetland edge meadows). On the other hand, the 959 acre estimate represents a scenario with primarily high intensity impacts resulting from long retrieval routes (3 miles one-way) that cross vegetation types that for the most part</p>	<p>Under Alternative 3, adverse impacts on vegetation and wetlands would be moderate. Trail construction, improvement, and maintenance would adversely impact a total of 10.7 acres of primarily dwarf birch shrublands, spruce-willow/alder woodlands, willow floodplain type wetlands, successional herbaceous vegetation, and willow shrub floodplain vegetation. This total includes about 1.5 acres of wetlands. In addition, approximately 250 acres of open gravel bar and water channels could be impacted by ORV operators traveling along the Upper Cantwell Creek and Bull River Floodplain routes. In addition, approximately 250 acres of open gravel bar and water channels could be impacted by ORV operators traveling along the Upper Cantwell Creek and Bull River Floodplain routes. If snowmobiles were used for a winter subsistence moose hunt, there is the possibility of vegetation damage from their use; however, regulations requiring adequate snow cover would minimize these impacts.</p> <p>The level of impact under this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or that</p>	<p>Under Alternative 4, adverse impacts on vegetation and wetlands would be minor. Trail improvement and maintenance would cause the continued vegetation loss on a total of 7 acres within primarily dwarf birch shrublands and spruce-willow/alder woodlands, including 0.4 acres of wetland vegetation. If snowmobiles were used for a winter subsistence moose hunt, there is the possibility of vegetation damage from their use; however, regulations requiring adequate snow cover would minimize these impacts.</p> <p>The level of impact under this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or that are key to the integrity of the park.</p>

	Alternative 1 (No Action)	Alternative 2	Alternative 3 (NPS Preferred Alternative)	Alternative 4
		<p>recover from ORV impacts within 6 to 15 years (e.g., willow and dwarf birch shrublands). Included within this off-trail range would be between 10 and 130 acres of adverse impacts to wetland vegetation (i.e., scattered wetlands within units of floodplain slopes, willow or alder shrublands, spruce-willow/alder woodlands, willow floodplain, and lightly vegetated gravel bars).</p> <p>Were the upper level of impacts to be reached, this alternative would result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or that are key to the integrity of the park.</p>	are key to the integrity of the park.	
Wildlife	<p>Actions in this alternative would have a major adverse impact on moose in the Cantwell TUA because levels of harvest would increase dramatically over the current average. Sex ratios or other population parameters could be changed as a result. In addition, noise from motorized equipment would disturb wildlife in general.</p> <p>The level of impacts to wildlife anticipated from this alternative would result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or that are key to the integrity of the park.</p>	<p>Actions proposed in this alternative would have a moderate adverse impact on wildlife in the TUA because the number of moose harvested each year would increase above the current average of 5 moose/year. The number of harvests would be capped to maintain natural and healthy populations. Noise from helicopters, airplanes, and ORVs would disturb wildlife but is not expected to cause any population-level impacts.</p> <p>The level of impacts to wildlife anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or that are key to the integrity of the park.</p>	<p>Actions proposed in this alternative would have a moderate adverse impact on wildlife in the TUA because the number of moose harvested each year would increase above the current average of 5 moose/year, and the number of wolves harvested would likely increase, though the number of harvests for moose and wolves could be capped to maintain natural and healthy populations. Noise from helicopters, airplanes, ORVs, and snowmachines would disturb wildlife.</p> <p>The level of impacts to wildlife anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or that are key to the integrity of the park.</p>	<p>Actions proposed in this alternative would have a minor adverse impact on wildlife in the TUA because the number of moose harvested would remain close to the current average of 5 moose per year, and the number of harvests would be capped to maintain natural and healthy populations. Wolves would be negatively impacted with the addition of a winter hunt, but harvest levels would be monitored and a limit proposed to maintain natural and healthy populations. Noise from administrative use of helicopters, airplanes, ORVs, and snowmachines would disturb wildlife but is not expected to cause any population-level impacts.</p> <p>The level of impacts to wildlife anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or that are key to the integrity of the park.</p>
Water Resources	<p>Impacts to water quality, channel morphology, and aquatic species would be minor to moderate because use of ORVs would negatively affect turbidity, bank stability, and aquatic species within the TUA; however, impacts would largely be confined to crossing sites and impacts would not affect the overall health of the moving water ecosystems. An increase in turbidity, sediment transport, suspended sediments, and sedimentation would be expected in Bull River, Cantwell Creek, Windy Creek, certain tributaries, wetlands, and possibly small ponds and lakes. Increased introduction of sediments into the TUA's water bodies would, in turn, adversely impact the relatively unexceptional fishery resources that may be present.</p> <p>The level of impacts to water resources anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or that are key to the integrity of the park.</p>	<p>Impacts to water quality, channel morphology, and aquatic species would be moderate for up to four years after implementation begins. During this time, use of ORVs would negatively affect turbidity, bank stability, and aquatic species in a portion of the streams and tributaries in the TUA. Impacts would be minor after four years because NPS trail construction, maintenance and reinforcement activities, coupled with the more intensive monitoring included in this alternative, would minimize some of the potential soil impacts, including the potential for erosion and subsequent sedimentation in water bodies. Cross-country use of ORVs would be somewhat restricted, monitoring degradation levels would mitigate damage, impacts that did occur would be confined to places where ORVs cross streams and tributaries, and impacts would not affect overall health of the ecosystem.</p> <p>The level of impacts to water resources anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or that are key to the integrity of the park.</p>	<p>Impacts to water quality, channel morphology, and aquatic species would be minor to moderate for up to four years after implementation begins. During this time, new construction and use of ORVs would negatively affect turbidity, bank stability, and aquatic species in a portion of the streams and tributaries in the TUA. The extent of this ground surface and soil disturbance has the potential, through erosion, to generate sediments that can degrade aquatic habitats and the fish species that depend on them.</p> <p>Impacts would be minor after four years because water control, trail hardening, and other trail work would be completed. Cross-country use of ORVs would be prohibited, monitoring degradation levels would mitigate damage, and impacts that did occur would be confined to where ORVs cross streams and tributaries. Use of snowmachines in the TUA would not be high enough to produce a measurable change in water quality parameters or health of aquatic species.</p> <p>The level of impacts to water resources anticipated from this alternative would not result in an impairment of park</p>	<p>Impacts to water quality, channel morphology, and aquatic species would be minor for up to four years after implementation begins. During this time, use of ORVs would negatively affect turbidity, bank stability, and aquatic species in a portion of the few streams and tributaries in the TUA that are adjacent to the four trails open to ORV use under this alternative. Impacts would be negligible after four years because water control, trail hardening, and other trail work would be completed. Cross-country use of ORVs would not occur, on-trail use would occur only in late summer and early fall, and monitoring degradation levels would mitigate damage. Use of snowmachines in the TUA would not be high enough to produce a measurable change in water quality parameters or health of aquatic species.</p> <p>The level of impacts to water resources anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or that are key to the integrity of the park.</p>

	Alternative 1 (No Action)	Alternative 2	Alternative 3 (NPS Preferred Alternative)	Alternative 4
Visitor Experience	<p>This alternative would have moderate negative impacts to visitor experience because standards for frequency and intensity of noise intrusions, number of encounters with people, evidence of modern human use, and signs of social trails, campsites, or cut or broken vegetation could be approached or exceeded during the summer. These factors would degrade the quality of the park setting and would likely put this part of the park out of compliance with the zoning scheme described in the 2006 <i>Denali National Park and Preserve Backcountry Management Plan</i>.</p> <p>The level of impacts to visitor experience anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or that are key to the integrity of the park.</p>	<p>Negative impacts to visitor experience would be minor to moderate because the standards for Management Area B and newly-imposed Corridors would be met, although the quality of the experience would be somewhat degraded by frequent noise intrusions and encounters with other people, modern equipment, and damaged vegetation.</p> <p>The level of impacts to visitor experience anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or that are key to the integrity of the park.</p>	<p>resources that fulfill specific purposes identified in the establishing legislation or that are key to the integrity of the park.</p> <p>Impacts to visitor experience would be minor to moderate because standards for the TUA could be approached or exceeded during winter, and the quality of the experience year-round would be somewhat degraded by increased frequency of noise intrusions and increased potential of encountering other people, modern equipment, and campsites.</p> <p>The level of impacts to visitor experience anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or that are key to the integrity of the park.</p>	<p>Impacts to visitor experience would be minor because standards for the TUA could be approached or exceeded during winter, and the quality of the experience would be somewhat degraded during fall by increased frequency of noise intrusions and increased potential of encountering other people, modern equipment, and campsites. The quality of the summer visitor experience would be improved by eliminating impacts from ORVs from the TUA during summer.</p> <p>The level of impacts to visitor experience anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or that are key to the integrity of the park.</p>
Wilderness	<p>Alternative 1 would cause major adverse impacts on wilderness resources because the lack of proactive management would result in two important wilderness resource values, presence of natural conditions and opportunities for solitude, being compromised by the perpetuation of existing damage and the expansion of many miles of new ORV trails throughout the TUA. The level of these adverse impacts would necessitate the re-designation of the current status of the TUA from eligible for wilderness designation to one of ineligible.</p> <p>The level of impacts to wilderness resource values anticipated from this alternative would result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or that are key to the integrity of the park.</p>	<p>Alternative 2 would result in major negative impacts to wilderness resource values within the TUA because dispersed cross country ORV use would occur throughout much of the area. Two important wilderness resource values, presence of natural conditions and opportunities for solitude, would be compromised by the perpetuation and expansion of several miles of user formed ORV trails. New trail construction would increase the presence of permanent human structures in the area.</p> <p>The level of impacts to wilderness resource values anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or that are key to the integrity of the park.</p>	<p>Alternative 3 would result in moderate negative impacts to wilderness resource values. ORV use in areas such as the Bull River would increase. New trail development and designation of existing trails would add to the presence of permanent human structures in the area. These impacts would be somewhat offset by the recovery of currently impacted areas. Maintenance of trails would also reduce their obtrusiveness. Confining ORV use to trails or routes, and allowing damaged areas to recover, would retain eligibility for wilderness designation status for the TUA.</p> <p>The level of impacts to wilderness resource values anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or that are key to the integrity of the park.</p>	<p>The actions in this alternative would result in overall moderate benefits to wilderness resource values, largely due to the elimination of ORV trails, routes, and dispersed ORV travel. There would be major improvements to the presence of natural conditions and solitude due to the recovery of large areas of impact and a reduced scope of motorized use. Minor impacts to both of these values as well as the absence of human structures would remain as a result of the established system of trails. Impacts from horsepacking or the winter hunt would be negligible. This alternative would be fully consistent with the current eligibility determination for the area.</p> <p>The level of impacts to wilderness resource values anticipated from this alternative would not result in an impairment of park resources that fulfill specific purposes identified in the establishing legislation or that are key to the integrity of the park.</p>
Subsistence Opportunities	<p>Actions in this alternative would have major negative impacts because subsistence moose hunting, facilitated by unrestricted ORV access, would be above a sustainable level in the TUA. Over the long term NPS qualified subsistence users would have to expend more time and effort hunting moose on non-park lands and could be affected by increasing restrictions as well as declining wildlife populations on those lands.</p> <p>The level of impacts to subsistence anticipated from this alternative would eventually result in a significant restriction to subsistence resources (moose).</p>	<p>Alternative 2 would result in minor beneficial effects to subsistence resources and opportunities because of extensive ORV access and proactive wildlife management that would provide for sustainable harvest over the next 10-15 years. Enhanced access to subsistence resources and opportunities would result from identifying and maintaining trails and routes for ORV use and the provision for ORV access for moose and caribou retrieval. The monitoring provisions and recommended management actions in the alternative, including subsistence harvest limits for moose and caribou, would make it possible to have a sustainable harvest level over the long term. The identified ORV trails and routes would be in good moose habitat, so for much of the subsistence hunting season (the</p>	<p>Alternative 3 would result in minor beneficial impacts to subsistence resources and opportunities because of improved access and proactive wildlife management that would provide for sustainable harvest over the next 10-15 years. Greater access to subsistence resources and opportunities would result from improvements to NPS-managed trails and routes, a new Bull River Access Trail, and improved access to the Bull River and Upper Cantwell Creek floodplains. The monitoring provisions and recommended management actions in the alternative, including subsistence harvest limits for moose and caribou, would make it possible to have a sustainable harvest level over the long term and remove uncertainty for NPS qualified subsistence users. The identified ORV trails and</p>	<p>Alternative 4 would result in minor adverse impacts to subsistence resources and opportunities. Access would be more difficult since ORV use would be allowed only on NPS-managed trails, and only beginning one week before the opening of hunting season. Competition among hunters in the TUA would increase, especially in and near the access corridors. However, a winter hunt would provide additional subsistence opportunities, and NPS qualified subsistence users would have the option of using other hunting and retrieval methods such as travel by horseback or on foot. Monitoring and proactive management, including subsistence harvest limits for moose and caribou, would provide for sustainable harvest over the next 10-15 years.</p>

	Alternative 1 (No Action)	Alternative 2	Alternative 3 (NPS Preferred Alternative)	Alternative 4
		<p>last half of August and the month of September) there would be improved opportunities to hunt moose near trails. Counteracting these benefits, however, would be the restrictions on ORV use for retrieval and increased competition among hunters in the TUA, especially in and near the access corridors. On balance the beneficial impacts to subsistence use would be minor over the long term.</p> <p>The level of impacts to subsistence anticipated from this alternative would not result in a significant restriction to subsistence resources or opportunities.</p>	<p>routes would be in good moose habitat, so harvests would be expected to increase. There would also be a winter hunt extending as long as possible, which if established would provide additional subsistence opportunities. Counteracting these benefits, however, would be restrictions on ORV use and increased competition among hunters in the TUA, especially in and near the access corridors. On balance the beneficial impacts to subsistence use would be minor over the long term.</p> <p>The level of impacts to subsistence anticipated from this alternative would not result in a significant restriction to subsistence resources or opportunities.</p>	<p>The level of impacts to subsistence anticipated from this alternative would not result in a significant restriction to subsistence resources or opportunities.</p>