

Chapter 2: Alternatives

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2.0 CHAPTER 2: ALTERNATIVES

2.1 Introduction

This section describes four action and a No Action alternative for managing ORV use on nine trails in the Nabesna District of Wrangell-St. Elias National Park and Preserve. Each action alternative presents a different means of meeting objectives through various combinations of trail improvement, trail administration, and identification of other trail opportunities. Also discussed are management actions common to all alternatives and actions that have been considered but dismissed from further analysis.

2.2 Development of the Alternatives

The NPS developed the alternatives for managing ORV use based on the legal, regulatory, and policy direction presented in Chapter 1, combined with resource and use information and concerns gathered by research in the park and at public scoping meetings (see Chapter 5, Consultation and Coordination).

In developing a reasonable range of alternatives, NPS took into consideration the following:

- The purpose and need described in Chapter 1 and objectives of the project described in this chapter.
- Most alternatives were developed to meet legal, regulatory, and policy direction presented in Chapter 1. However, an alternative is not automatically rendered unreasonable if it requires the amending of a park plan or policy; causes a potential conflict with local, state, or federal law; or lies outside the scope of what Congress has approved or funded or outside the legal jurisdiction of the NPS. Sometimes an alternative may be presented so that the analysis can demonstrate that taking such action would result in non-compliance with legal, regulatory, and policy direction.
- Public comment and suggestions.
- Long-term trail management considerations to increase sustainability, reduce maintenance and environmental impacts, and ensure long-term utility of an actively managed trail system.
- Environmental constraints relative to trail construction and maintenance. For example, while it may be technically feasible to maintain a trail through a wetland, it may make better economic or environmental sense to re-route the trails around a wetland.

Though the NPS' goal is to begin to implement the ORV Management Plan within 1 to 5 years, funding for implementation is not guaranteed. The Plan would establish a vision for future trail management in the Nabesna District, but full implementation could be many years in the future. While the NPS would bear the responsibility for directing and managing maintenance, improvements and new construction of any proposed ORV or foot trails or routes, the ORV users themselves would be encouraged to engage in a cooperative effort with the NPS to provide labor and equipment for a portion of the work.

The following topics are discussed for each alternative:

- Trail improvements (trail re-construction, hardening, or re-routing) and trail maintenance.

- Recreational ORV use. This includes the use of ORVs to access sport hunting in the preserve area.
- Subsistence ORV use.
- Non-motorized trails or routes.
- Monitoring Standards and Management Actions. These are standards developed by the NPS to monitor resource impacts associated with ORV trail use over time.

More information regarding trail monitoring strategies and trail sustainability standards are included in Appendices B and C, respectively.

2.3 Actions Common to all Action Alternatives

Trail condition terms are defined as follows:

Design-sustainable condition: a trail that meets a specific set of design criteria formulated to provide a high level of environmental protection and long-term utility of the tread surface under a managed program of anticipated use and normal climatic conditions, and receives regular maintenance to remain within its original design specifications.

Maintainable condition: a trail that only partially meets design-sustainable criteria, but with a reasonable level of mitigation and maintenance can support a managed level of use without unacceptable environmental degradation or a decrease in travel surface utility.

The following actions are included in each of the action alternatives, Alternatives 2, 3, 4, and 5.







Revised Wilderness Eligibility Map

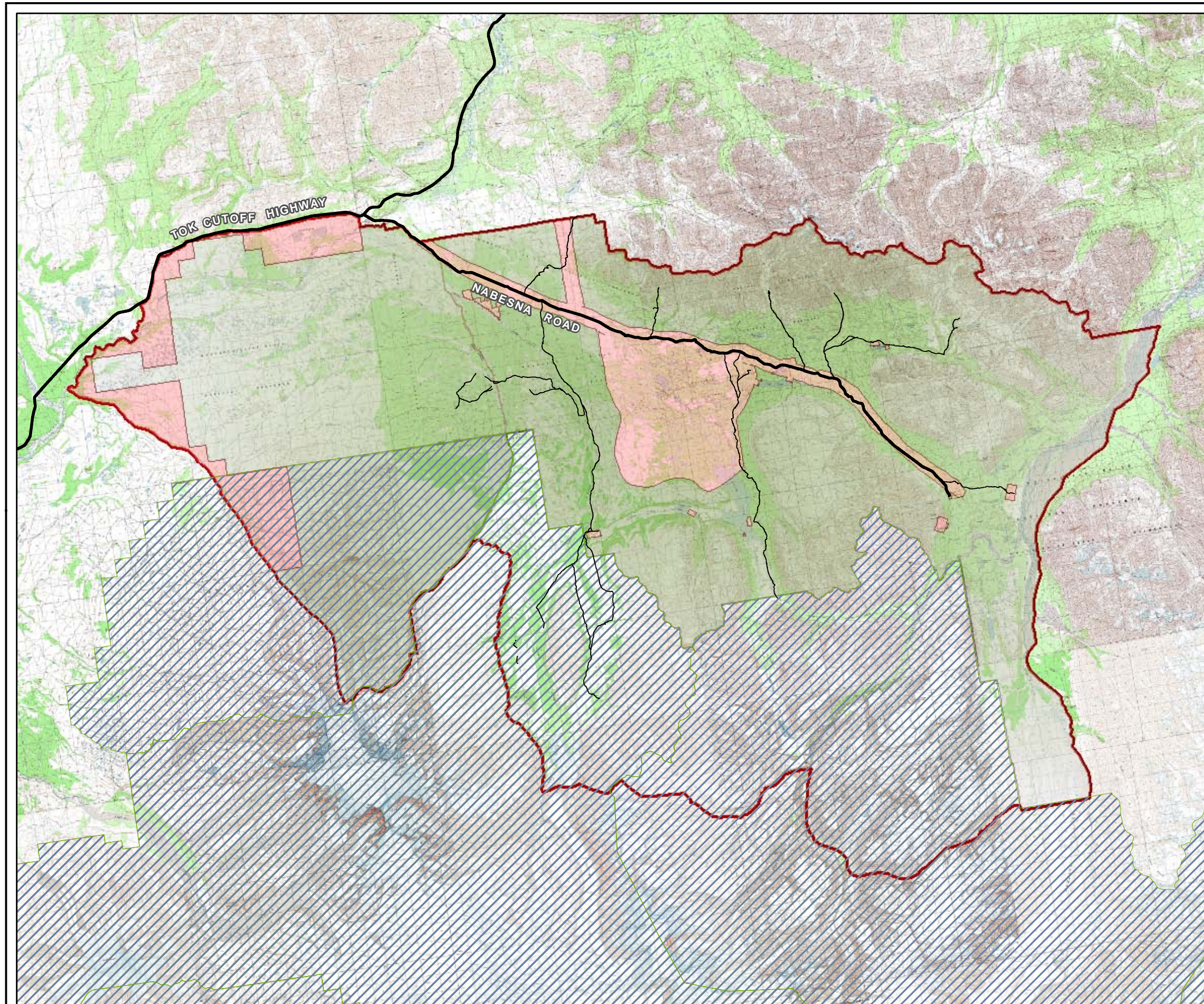
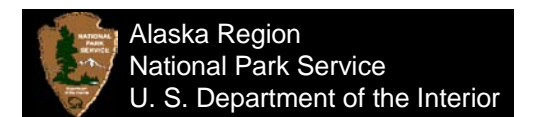
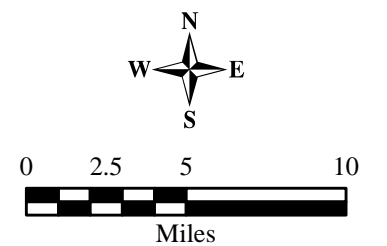
As discussed in Section 1.7.5 of this Plan/EIS, the 1986 GMP for Wrangell-St. Elias National Park and Preserve included a wilderness eligibility assessment and map. Determination of eligibility was based on a set of criteria developed by the NPS in 1986. As part of the Nabesna ORV Management Plan/EIS planning process, the eligibility assessment and map are proposed to be revised for the following reasons:

- The areas mapped as eligible or ineligible on generalized 1986 maps are not consistent with the narrative or criteria used in 1986.
- Some areas (motorized trail corridors) that met the criteria for being ineligible in 1986 were not mapped as such.
- Land status has changed.

Figure 2-1 shows the 1986 wilderness eligibility map, depicting designated, eligible, and ineligible lands within the analysis area. Figure 2-2 shows the proposed revised wilderness eligibility map. Appendix A describes in detail the 1986 eligibility criteria and justification for proposing eligibility revisions.





Figure 2-1
1986 Wilderness
Eligibility Assessment

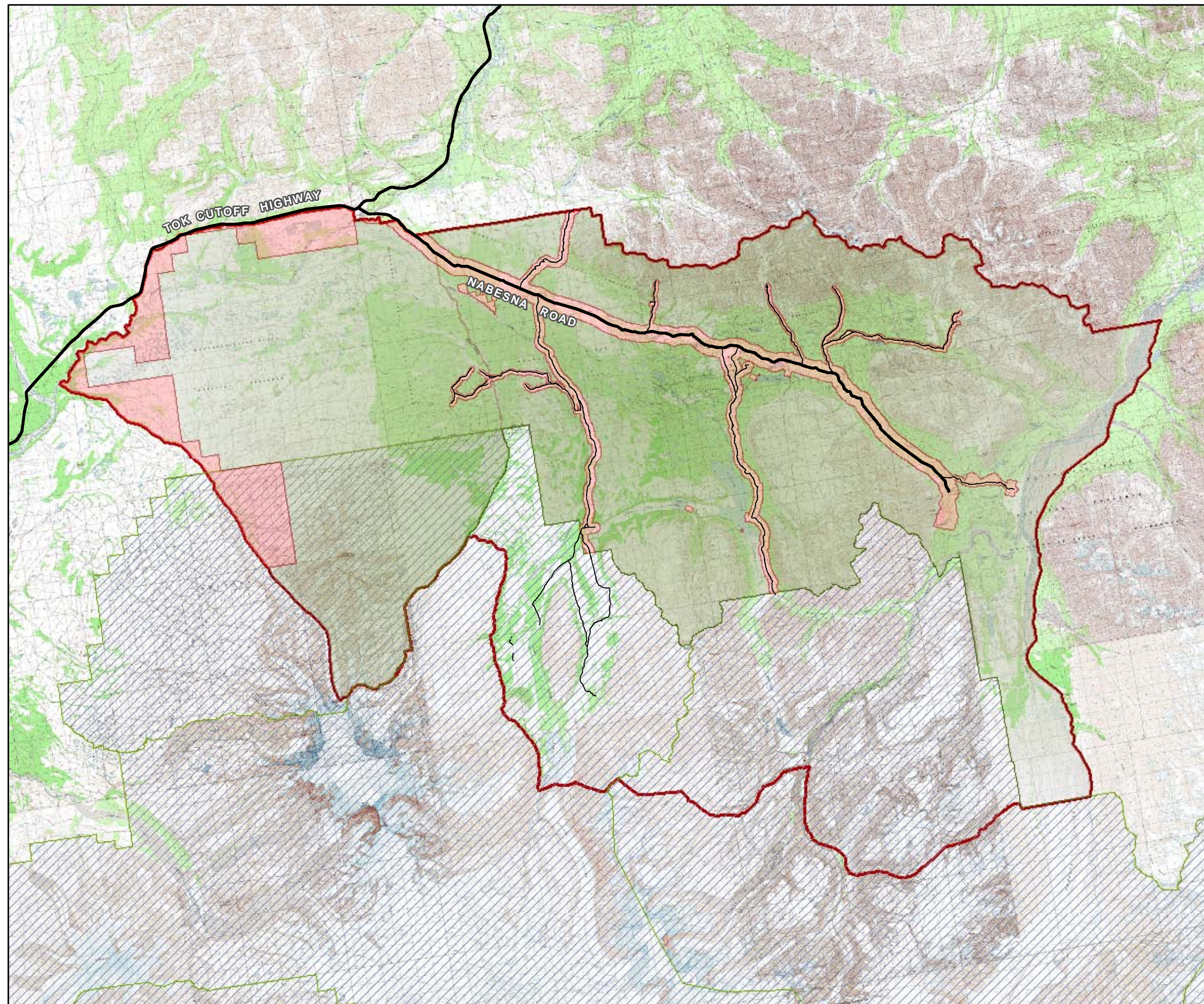
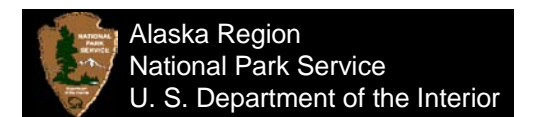
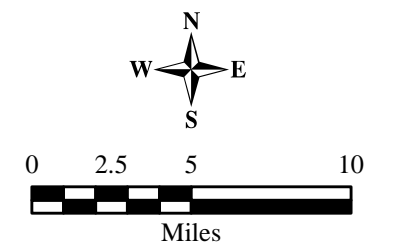
-  Existing Roads
-  Analyzed Motorized Trails
-  Designated Wilderness
-  1986 Eligible Area
-  1986 Ineligible Area
-  Analysis Area



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Figure 2-2
Proposed Revision to
1986 Wilderness
Eligibility Assessment

- Existing Roads
- Analyzed Motorized Trails
-  Designated Wilderness
-  Revised Eligible Area
-  Revised Ineligible Area
-  Analysis Area



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Recreational ORV Use

The following classes of vehicles, because of their size, width, or weight, would not be permitted on any of the nine trails for recreational purposes: a) Nodwells or other tracked rigs greater than 5.5 feet in width or 4,000 pounds curb weight; b) street legal highway vehicles; c) custom 4x4 jeeps, SUVs, or trucks designed for off-road use; d) original or modified 'deuce and a half' cargo trucks (2 ½-ton military 6x6 trucks); e) dozers, skid-steer loaders, excavators, or other construction equipment; f) motorcycles or dirt bikes; and g) log skidders. Wheeled vehicles (including all terrain vehicles [ATVs], utility vehicles [UTVs], and Argos) must be less than 1,500 pounds curb weight, not including trailers. In addition, due to existing trail conditions, only track vehicles will be permitted to operate on the Boomerang trail.

If the alternative ultimately selected for implementation permits recreational ORV use, that use would be authorized through promulgation of a regulation.

Recreational ORV users would be required to obtain a permit. Permits would have the following specific conditions stipulated:

- Travel is only permitted on designated trails listed on the permit.
- Stay on designated trails.
- If hunting or gathering, park ORVs off to the side of the trail and walk off trail. Vehicles may not be used to retrieve game or gathered materials off of the designated trail alignment. Creating new trails is prohibited.
- ORV use is prohibited in designated wilderness areas.

Subsistence ORV Use

The following classes of vehicles, because of their size, width, or weight, would not be permitted on any of the nine trails for subsistence use: a) Nodwells or other tracked rigs greater than 5.5 feet in width or 4,000 pounds curb weight; b) custom 4x4 trucks, jeeps or SUVs designed for off-road use; c) original or modified 'deuce and a half' cargo trucks (2 ½-ton military 6x6 trucks); d) dozers, skid-steer loaders, excavators, or other construction equipment; and e) log skidders. Wheeled vehicles (including ATVs, UTVs, and Argos) must be less than 1,500 pounds curb weight.

Subsistence ORV use is authorized through Title 36 CFR 13.460. Proposed restrictions would be implemented through park-specific regulation or pursuant to 36 CFR 13.460 (b) and (c).

ORVs for Accessing Private Inholdings

The use of ORVs for accessing private inholdings within the analysis area would be managed consistent with ANILCA Section 1110(b), Implementing Regulations at Title 43 CFR 36.10(e)(1), and the NPS Alaska Region's policy for access. Five of the nine trails on which recreational ORV use has been permitted (Suslota, Soda Lake, Reeve Field, Tanada Lake, and Copper Lake) also have been utilized to access private inholdings. Administrative actions such as trail closures proposed within the range of management alternatives considered in this document may apply to ORV use for accessing private inholdings in certain circumstances. Proposals to improve trails to a maintainable condition would be consistent with the goal of maintaining access that "has not resulted in

unacceptable impacts to park resources and values, and can be maintained in their present condition and character and essentially within their existing footprints” (NPS 2007b).

Currently, the use of ORVs to access private inholdings constitutes a very small proportion of the total ORV use (less than five percent). Because trail use estimates were based in part on trail counter data, the effects of the use of ORVs for accessing private inholdings are analyzed in the direct and indirect effects presented in Chapter 4 of this document.

Closures

Closures to recreational ORV use would be maintained at current locations at the end of Trail Creek, Lost Creek, and Caribou Creek trails and beyond Boomerang Lake. These closures are in effect and would remain in effect to maintain non-motorized opportunities and for resource protection. These areas would remain open to subsistence ORV use. Under all action alternatives, the Skookum Volcano trail and the Trail Creek to Lost Creek route would remain closed to recreational ORV use.

Reeve Field Alaska Native Claims Settlement Act (ANCSA) Easement

The Reeve Field trail crosses private property before reaching the Nabesna River. There is an existing ANCSA 17(b) easement that exists across the private property. The NPS would work with the private landowners to ensure that the easement is properly marked and signed and that it is connected with the ORV trail location upon entry to private lands.

2.4 Alternative Descriptions

2.4.1 Alternative 1—No Action

Overview

The NPS would continue the present management direction under conditions of the lawsuit settlement. Recreational ORV use would be permitted on portions of seven of the nine trails and authorized under Title 43 CFR 36.11(g)(2). There would be no change in administration of subsistence ORV use. Prior to the lawsuit settlement, there were 93.8 miles of trail open to recreational ORV use. This alternative would continue the closure of 38.3 miles (41 percent) of the trails to recreational ORV use in order to minimize resource impacts. However, subsistence ORV use would continue unrestricted. The proposed trail system under Alternative 1 is shown in Figure 2-3.

Trail Improvements and Maintenance

No trail improvements (re-construction, hardening, or re-routing) would occur under this alternative. Trail maintenance would continue at current levels (maintenance responding to safety-related trail problems or acute resource impacts).

Recreational ORV Use

Recreational ORV use would be permitted on portions of seven of the nine trails, as follows: Caribou Creek trail, Trail Creek trail, Lost Creek trail, Soda Lake trail, Reeve Field trail, Boomerang trail, and Copper Lake trail to the Boomerang trail turn-off. Recreational ORV use would not be permitted on the Suslota trail, Tanada Lake trail, and Copper Lake trail past the Boomerang trail turn-off during the season when unfrozen conditions are present (typically May 15–October 15).

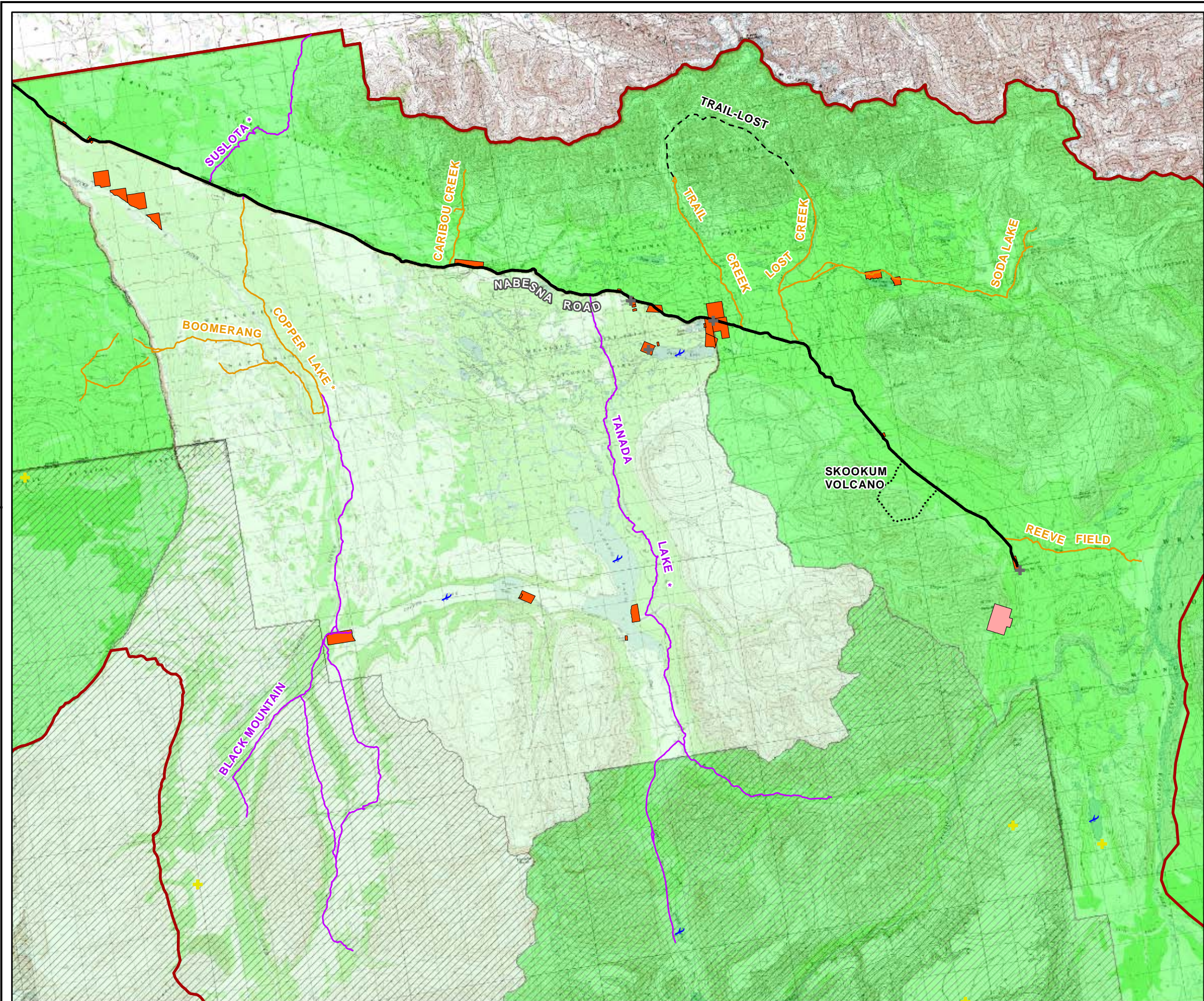
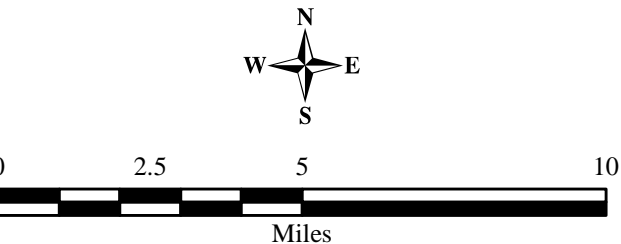


Figure 2-3
Alternative 1
Proposed Trail Uses

- Existing Roads
- Motorized Trail Open for Recreational & Subsistence ORV Uses
- Motorized Trail Open for Subsistence ORV Use
- * Trails are open to recreational ORV use when frozen.
- Open Non-motorized Trail
- Open Non-motorized Route
- Float Landing
- Landing Strip
- Private Airstrips
- NPS Land Status - Non-public Lands
- Mining
- Small Tract
- Analysis Area
- Park
- Park/Wilderness
- Preserve
- Preserve/Wilderness

Motorized trails are also open for non-motorized recreational or subsistence use.
Closed trails are not shown.
Most airstrips shown on this map are not maintained and are not suitable for general public use.
Suitability for use is highly dependent on weather conditions, type of aircraft, and pilot skill.



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Subsistence ORV Use

NPS qualified subsistence users would continue to employ ORVs for subsistence purposes on all nine trails and throughout the analysis area. Subsistence users would be encouraged but not required to obtain a permit and would be encouraged to utilize established trails or dry stream beds to reduce impacts.

Non-motorized Trails or Routes

No new non-motorized trails or routes would be considered for layout, marking, or construction.

2.4.2 *Alternative 2*

Overview

NPS would permit recreational ORV use on all nine trails (93.8 miles). This alternative represents pre-lawsuit conditions. There would be no change to subsistence ORV use and no major trail improvements would occur. The proposed trail system under Alternative 2 is shown in Figure 2-4.

Trail Improvements and Maintenance

No major trail improvements (re-construction, hardening, or re-routing) would occur under this alternative. Trail maintenance would continue at current levels (maintenance responding to safety-related trail problems or acute resource impacts).

Recreational ORV Use

Recreational ORV use would be permitted on all of the nine trails, as follows: Suslota trail, Caribou Creek trail, Trail Creek trail, Lost Creek trail, Soda Lake trail, Reeve Field trail, Tanada Lake trail to the designated wilderness boundary, Boomerang trail, and Copper Lake trail to Copper Lake.

Subsistence ORV Use

NPS qualified subsistence users would continue to employ ORVs for subsistence purposes on all nine trails and throughout the study area. Subsistence users would be encouraged but not required to obtain a permit and would be encouraged to utilize established trails or dry stream beds to reduce impacts.

Non-motorized Trails or Routes

No new non-motorized trails or routes would be considered for layout, marking, or construction.

Monitoring Standards

The NPS would continue to monitor the impacts of ORV use in the study area through trail assessments every 5 years. However, the NPS would not establish specific impact standards to aid in determining when management action is needed.

2.4.3 Alternative 3

Overview

This alternative addresses resource impacts through trail administration with little investment in trail improvements. Recreational ORV use would not be permitted on 93.8 miles (100 percent) of the trails in the analysis area. About 2.5 miles of motorized trail would be improved for subsistence ORV use or non-motorized uses. There would be no change to subsistence ORV use. The proposed changes to the trail system and the allowable uses under Alternative 3 are shown in Figures 2-5 and 2-6, respectively.

Trail Improvements

The following trail improvements (shown in Figure 2-5) would occur:

- Soda Lake Re-route: A re-route would be constructed from Lost Creek to Platinum Creek to avoid private property. This re-route would also by-pass most of the trail segments currently classed as degraded or very degraded. These improvements would result in a 12-mile segment of design-sustainable trail. Once the re-route is completed, the old trail would be closed to all motorized users (except those accessing private land) to allow for vegetation and soils recovery.

Trail maintenance would continue at current levels (maintenance responding to safety-related trail problems or acute resource impacts).

Recreational ORV Use

Recreational ORV use would not be permitted on any of the nine trails or within the analysis area.

Subsistence ORV Use

NPS qualified subsistence users would continue to employ ORVs for subsistence purposes on all nine trails and throughout the analysis area. Subsistence ORV use would be subject to the monitoring standards for unimproved trails described below. Subsistence users would be encouraged but not required to obtain a permit and would be encouraged to utilize established trails or dry stream beds to reduce impacts.

Non-motorized Trails or Routes

The following non-motorized routes or trails (shown in Figure 2-5) would be added to the trails system:

- Rock Creek trail: Links the upper end of the Caribou Creek trail to the Nabesna Road at the Rock Creek crossing.
- Platinum-Soda route: links Upper Platinum to Soda Lake.
- Platinum-Reeve route: Links Lower Platinum Creek to the Reeve Field trail.
- Sugarloaf route: Links Skookum Volcano trail to Tanada Lake.

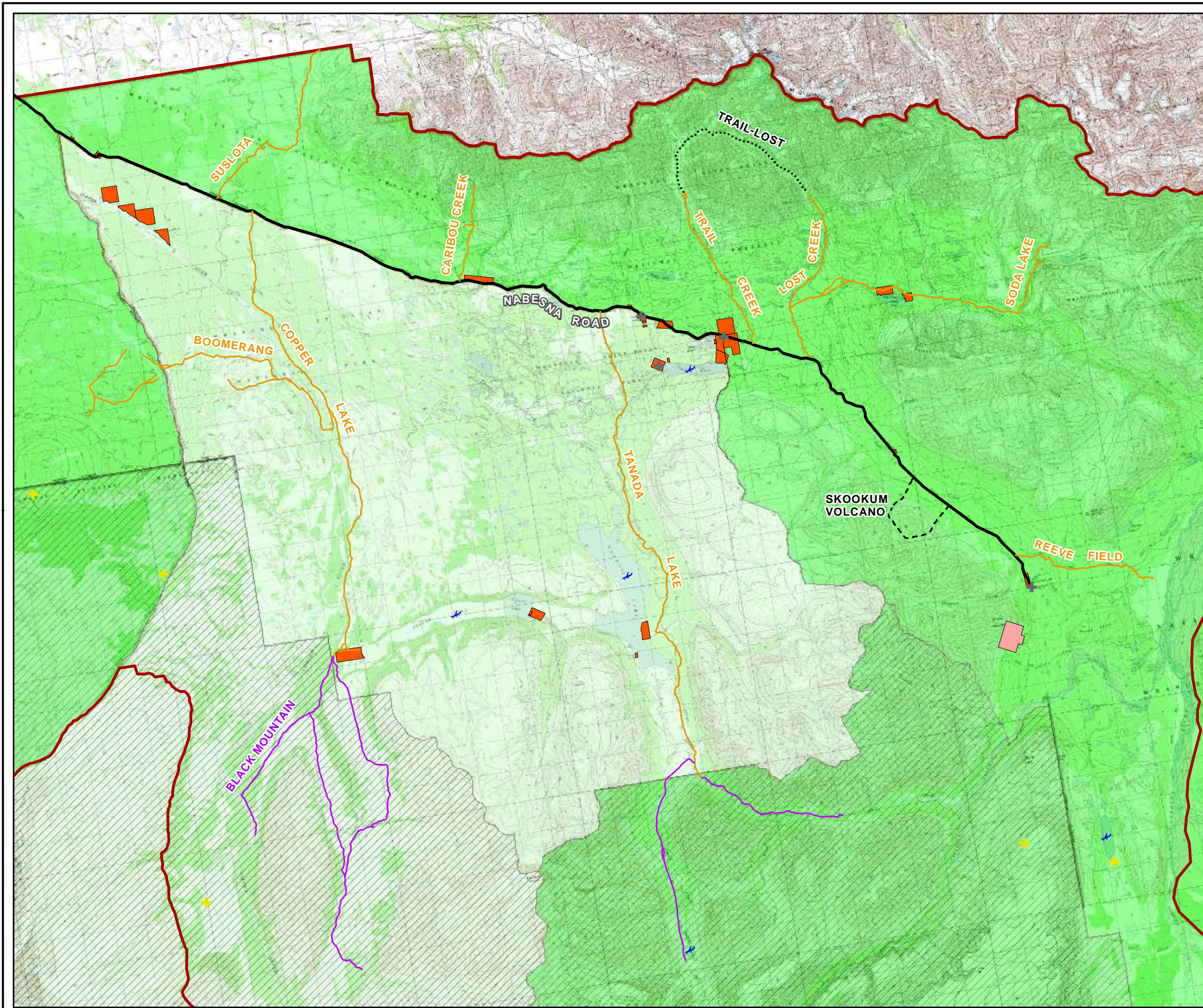
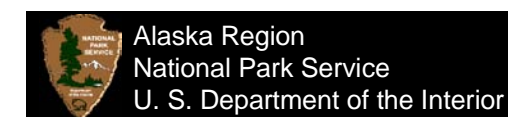
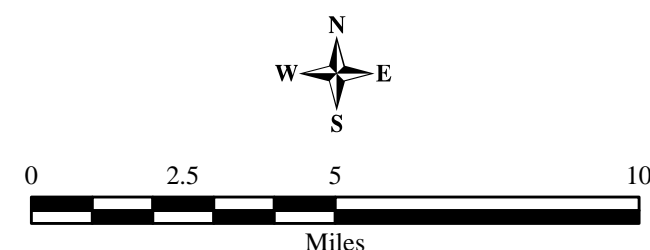


Figure 2-4
Alternative 2
Proposed Trail Uses

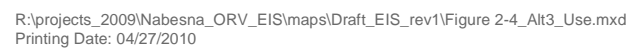
- Existing Roads
 - Motorized Trail Open for Subsistence ORV Use
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Motorized trails are also open for non-motorized recreational or subsistence use.
 Closed trails are not shown.
 Most airstrips shown on this map are not maintained and are not suitable for general public use.
 Suitability for use is highly dependent on weather conditions, type of aircraft, and pilot skill.



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A total of 26.2 miles of non-motorized routes or trails would be added (Table 2-1). Trail construction includes brushing and tread construction along a designed and laid-out route, incorporating all sustainable trail guidelines identified in Appendix C, including contour alignment, controlled grade, integrated water control, full bench construction, durable tread surface, and appropriate long-term maintenance. Construction of non-motorized trails identified in this ORV Management Plan/EIS may require further environmental analysis to evaluate impacts associated with new construction and necessary mitigation measures. A route is a described passage through the terrain between two points. No tread construction occurs. The route may be marked at key locations utilizing rock cairns, carsonite posts, or other minimal marking techniques to provide reassurance to users and to guide passage through challenging sections. Routes typically have relatively low levels of use and are intended to guide dispersed use, which limits potential impacts from concentrated use. Users would be encouraged to select their own pathways along the route to prevent a worn-in track from developing. Because they are not constructed, sustainable trail design guidelines can not be applied. If use levels were great enough to create degradation issues, entire routes or portions of routes could be converted to trails where sustainable layout and trail construction would be applied.

Monitoring Standards

Unimproved Trails

Monitoring transects would be established in fixed representative locations on degraded, very degraded, and severely degraded portions of the following trails: Suslota, Caribou Creek, Soda Creek, Reeve Field, Tanada Lake, Copper Lake, and Boomerang. Each transect would run perpendicular to the existing trail and would measure trail impact width, number of braids, average depth of wheel ruts, and percentage of ground cover. Measurements of trail impact width and trail braids include active and inactive trail segments. Additionally, at degraded ORV stream crossings, permanent transects would be established measuring stream cross-sections. Transects established at the beginning of the monitoring period would provide baseline information. Re-assessment of transects and qualitative observations along good and fair portions of the trails will be conducted every 3 years would determine whether standards are being met and corrective management actions are required.

Table 2-2 presents the resource impact indicators, and standard/action level for unimproved trail segments. If monitoring indicates that standards are not being met and the magnitude or degree of resource impacts is increasing over time, action would be taken to address the problem through management of subsistence ORV use. Actions would be limited to only those trails showing increased resource impacts.

For any specific trail, exceeding the standard on three or more of the eight measured indicators would result in management action to correct the problem.

Management Tools to Respond to Monitoring of Unimproved Trails

Table 2-3 lists the tools that may be used to manage subsistence ORV use when necessary in response to unacceptable impacts. These tools are arranged in rough order from the least restrictive to the most restrictive. There would be no requirement that the tools must be tried in the listed order and a failure elicited before trying the next one.

Table 2-1. Alternative Comparison Table

Topic	Alternative				
	1 (No Action)	2	3	4	5
Trail Improvements and Maintenance	None.	None.	12 miles improved to design sustainable or maintainable (Soda Lake Re-route).	57.5 miles improved resulting in 86.5 miles in at least a maintainable condition.	58.5 miles improved resulting in 87.5 miles in at least a maintainable condition.
Recreational ORV Use	55.5 miles of trail open to recreational ORV use.	93.8 miles of trail open to recreational ORV use.	Zero miles of trail open to recreational ORV use.	After trail improvements, 32.6 miles open to recreational ORV use. User fee.	After trail improvements, 86.5 miles open to recreational ORV use. User fee.
Subsistence ORV Use	All trails open for subsistence ORV use.	All trails open for subsistence ORV use.	All trails open for subsistence ORV use. Subject to monitoring of resource impacts on unimproved trails.	All trails open for subsistence ORV use. Subject to monitoring of resource impacts on unimproved and improved trails.	All trails open, subject to monitoring of resource impacts on unimproved and improved trails and off-trail use. ORVs not allowed off designated trails in designated wilderness.
Non-motorized Trails or Routes	No new trails or routes considered.	No new trails or routes considered.	26.2 miles of non-motorized routes or trails considered.	48.1 miles of non-motorized routes or trails considered.	76.9 miles of non-motorized routes or trails considered.
Anticipated Level of Resource Improvement	None. However, reduces ORV use over 80% of trail segments classed as degraded or worse.	None. No trail improvements and no reduction of ORV use over any degraded trail segment.	Improves 3% of trail segments classed as degraded or worse; reduces ORV use on all nine trails by 20–70%.	Improves 87% of trail segments classed as degraded or worse and closes old segments to allow for recovery.	Improves 88% of trail segments classed as degraded or worse and closes old segments to allow for recovery.
Monitoring Standards and Management Actions	None developed.	None developed.	Monitoring standards developed for unimproved trails. If resource impacts increase, management actions considered.	Monitoring standards developed for unimproved and improved trails. If resource impacts increase, management actions considered.	Monitoring standards developed for unimproved and improved trails, and off-trail use. If resource impacts increase, management actions considered.
Trail Improvement Cost	\$0	\$0	\$461,885	\$3,228,995	\$3,979,585

Table 2-2. Alternative 3, 4, and 5 Monitoring Indicators and Standards for Unimproved Trails

Resource	Impact Indicator	Standard And Action Level
Wetlands	Trail impact width	Disturbance width increases by greater than 5%.
	Braiding	The addition of any new braids.
Water Quality	Erosion sedimentation	Stream or run-off capture that causes erosion or sediment deposition that was not present in the last assessment. Based on general observation.
Soils	Soil compaction	Average depth of wheel ruts or track depressions within active trails increase by more than 10%.
Vegetation	Bare ground	Within active trails, any increase in average measured bare ground by more than 20%.
Fish Habitat	Stream cross-section at 15 degraded crossings	20% or greater increase in width/depth ratio.
	Stream sedimentation	For salmonid spawning areas, measure cobble-embeddedness with an 80% probability of detecting a 10% or greater change.
Cultural Resources	Site disturbance	Any measurable impact to documented sites, based on condition assessment every 5 years.

Table 2-3. Alternative 3, 4, and 5 Management Tools That May Be Used to Manage Subsistence ORV Use in Response to an Increase in Resource Impacts

Site-specific Maintenance	Maintenance would be targeted at the trail segment where impact standards are exceeded. Maintenance could include such measures as spot hardening or short re-routes.
Vehicle Class Restrictions	On wet trails, NPS would consider only permitting certain classes of ORVs, such as tracked vehicles.
Reduction of Use	The NPS would restrict access at particular times of year and on specific trails based upon surface conditions.
Closures	Using the appropriate authorities, the NPS would close specific trails or areas of the park to ORV use or to specific types of access until conditions stabilize or recover. Area closures would be delineated utilizing wetland mapping and identifying those areas most susceptible to resource impacts.

2.4.4 Alternative 4

Overview

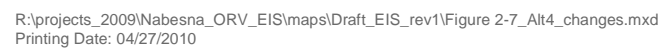
This alternative would improve eight of the nine trails (57.5 miles) to a design-sustainable or maintainable condition in order to provide access while protecting park resources. The proposed changes to the trail system and the allowable uses under Alternative 4 are shown in Figures 2-7 and 2-8, respectively. Most trails within the area would be managed in the maintainable condition, while all new construction, major re-constructions, and/or re-routes would be constructed to meet a design-sustainable condition.

Once improvements are in place, recreational ORV use would be permitted on trails in the National Preserve but not trails in the National Park (Tanada Lake, Copper Lake, and Boomerang). This represents 61.2 miles (65 percent) of the trails where recreational ORV use would not be authorized. Subsistence ORV use would be allowed on improved and unimproved trails, subject to monitoring/management actions described below.

Trail Improvements and Maintenance

The following trail improvements (shown in Figure 2-7) would occur:

- Lost Creek trail: A single trail alignment would be bladed up the existing gravel route to consolidate travel and minimize stream crossings. Improvements would result in a maintainable trail.
- Trail Creek trail: A single trail alignment would be bladed up the existing gravel route to consolidate travel and minimize stream crossings. Improvements would result in a maintainable trail.
- Suslota trail: No improvements would occur on this trail.
- Caribou Creek trail: Improvements would consist of major trail hardening utilizing local gravel sources and/or other trail-hardening methods, re-alignment of creek crossings, re-alignment of a sidehill traverse, and re-grading of the upper portion of the trail. These improvements would result in a maintainable trail.
- Soda Lake Re-route: A re-route would be constructed from Lost Creek to Platinum Creek to avoid private property. This re-route would also by-pass most of the trail segments currently classed as degraded or very degraded. These improvements would result in a design-sustainable trail along 7 miles of the upland section and 5 miles of maintainable trail along the floodplain sections. Once the re-route is completed, the old trail would be seasonally closed to all motorized users (except those accessing private property) to allow for vegetation and soils recovery.
- Reeve Re-route: A re-route would be constructed utilizing an old road alignment. Some areas of trail hardening would be required. This re-route would by-pass all trail segments currently classed as degraded, very degraded, or extremely degraded. Bridges suitable for ORV passage would be constructed at both Jack Creek crossings. These improvements would result in a maintainable trail. Once the re-route is completed, the old trail section would be seasonally closed to all motorized users to allow for vegetation and soils recovery.
- Tanada Re-route: The trail would be re-constructed to the wilderness boundary utilizing a constructed re-route to the east of the existing trail. The construction of the re-route would require development of a small gravel pit south of the Nabesna Road near Trail Creek, a bridge across Jack Creek, some spot hardening, and full-bench trail construction utilizing mechanized equipment. These improvements would result in sections of sustainable design and maintainable trail. Once the trail is re-constructed, old degraded trail segments would be closed to all ORV use to allow vegetation and wetland recovery.
- Copper Lake Re-route: The trail would be re-constructed in segments. The first segment would utilize the existing trail alignment to Tanada Creek. This section would be widened and built up with gravel excavated from adjacent ditchlines. Supplemental gravel capping and plank tread would be installed in some locations. The trail re-construction in this segment and a bridge at Tanada Creek would result in a maintainable trail. Past the Tanada Creek crossing additional ditch and cap work would be constructed for approximately 1.5 miles at which point a descending bench cut would be constructed to access the Copper River floodplain. This second segment would be a trail re-route along the Copper River floodplain to the cutoff trail to Boomerang and then continuing south utilizing well-drained alluvial gravel soils on elevated terraces along the river floodplain, side-slope bluff bench cuts, some well-drained soils near the top edge of the



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bluff, and some sections of hardened trail to access Copper Lake. This would result in a design-sustainable trail. The third segment would be improvement of existing trails in the designated wilderness south of Copper Lake. Improvements would consist of minor re-routes, drainage structures, or spot hardening. All work in designated wilderness would be done using hand crews. On all segments, once trail segments are re-constructed, old degraded trail segments would be closed to all ORV use to allow vegetation and wetland recovery. An easement across the private property located west of Copper Lake would be a prerequisite to doing any trail improvement on any segment of the Copper Lake or Black Mountain trail system.

- Boomerang trail: From the Copper Lake trail there would be an un-improved ford across the Copper River and then improvements made to an existing ramp that climbs out of the active floodplain. No improvements are planned for the rest of the Boomerang trail. This would result in a maintainable trail section at the ramp area.
- Trail system south of Tanada Lake in the designated wilderness: These existing trails (Pass Creek and Goat Creek trails) would be improved. Improvements would consist of minor re-routes, drainage structures, or spot hardening. All work in designated wilderness would be done using hand crews.

Once proposed trail improvements are in place, trail maintenance would increase to a level that would correct unsafe situations, correct natural resource damage, and restore the trail to the planned design standard.

Recreational ORV Use

After trail improvements, recreational ORV use would be permitted on trails in the National Preserve. This includes the Caribou Creek, Trail Creek, Lost Creek, Soda Lake, and Reeve Field trails. Recreational ORV use would not be permitted on trails within the National Park (Tanada Lake trail, the Copper Lake trail, and the Boomerang trail) or on the Suslota trail.

Prior to trail improvement, NPS would permit recreational ORV use on trails in fair or better condition. This would include Lost Creek and Trail Creek trails. Recreational ORV use would not be authorized on the other trails (Caribou Creek, Soda Lake, and Reeve Field) until improvements are completed that would prevent any additional degradation to these trails.

A trail use fee would be implemented to help offset the costs associated with improvements to recreational ORV trails. All recreational ORV users would be required to pay a user fee. The fees assessed to users would be applied to the cost of continued recreational access through improvement and maintenance of trails.

Subsistence ORV Use

Prior to trail improvements, trails would be open to subsistence ORV use but subject to monitoring/management actions described below under monitoring standards for unimproved trails. After completion of proposed improvements, trails would be open to subsistence ORV use, subject to monitoring/management actions described below under monitoring standards for improved trails. On trails where degraded segments are replaced by trail re-construction or re-routes, the old degraded segment will be closed to all ORV use to allow for recovery of vegetation, soils, and wetlands.

Non-motorized Trails or Routes

The following non-motorized trails or routes (shown on Figure 2-7) would be constructed or marked:

- Rock Creek trail: Links the upper end of Caribou Creek trail to the Nabesna Road at the Rock Creek crossing.
- Platinum-Soda route: Links Upper Platinum to Soda Lake.
- Platinum-Reeve route: Links Lower Platinum Creek to the Reeve Field trail
- Sugarloaf route: Links the Skookum Volcano trail to the Tanada Spur trail
- Tanada Spur trail: Trail from the improved Tanada Lake trail to Tanada Lake.
- Wait-Nabesna route: Route from the wilderness boundary on the Tanada Lake trail up Goat Creek, up Pass Creek, down Wait Creek, along Jacksina Creek to Nabesna Road
- 4-mile trail: Trail from the 4-mile point on the Nabesna Road to the Copper River.

A total of 48.1 miles of non-motorized routes or trails would be added. A description of the difference between routes and trails is provided in this same section under Alternative 3 (Section 2.4.3 Alternative 3, Non-motorized Trails or Routes).

Monitoring Standards

Unimproved Trails

Under this alternative, all nine trails would be improved to at least a maintainable condition. In the interim, recreational ORV permits would only be issued for trails in fair or better condition (Lost Creek and Trail Creek trails). Prior to improvements, subsistence ORV use could occur, subject to the standards and management actions for unimproved trails described below.

Table 2-2 presents the resource, impact indicators and standard/action level for unimproved trail segments. If monitoring indicates that standards are not being met and the magnitude or degree of resource impacts is increasing over time, action would be taken to address the problem through management of subsistence ORV use. Actions would be limited to only those trails showing increased resource impacts.

For any specific trail, exceeding the standard on three or more of the eight measured indicators would result in management action to correct the problem.

Management Tools to Respond to Monitoring of Unimproved Trails

Table 2-3 lists the tools that may be used to manage subsistence and inholder ORV use when necessary in response to unacceptable impacts. These tools are arranged in rough order from the least restrictive to the most restrictive. There would be no requirement that the tools must be tried in the listed order and a failure elicited before trying the next one.

Improved Trails

Once trails are improved, they would be monitored to ensure that they adequately provide tread utility along a single alignment. Table 2-4 presents a set of impact standards for several indicator categories. Monitoring would take place every 5 years and would occur through the use of general observations along improved portions of trails, rather than at fixed transect points. Not meeting any of the five impact standards on an improved trail section would result in management actions being taken for that specific trail.

Table 2-4. Alternative 4 and 5 Standards for Improved Trail Segments

Category	Impact Standards
Trail Width	Trail width exceeds design width specifications or original construction by greater than 30%.
Braiding	Braiding is occurring.
Surface Compaction	Wheel ruts, track depressions, or any other sort of trail surface compaction have depressed the trail tread surface greater than 6 inches below the original tread surface along any 50-foot or longer section of trail.
Soil Erosion	Any evidence of active transport erosion along any 50-foot or longer section of trail.
Mud-muck	Trail surface has a thick surface of mud greater than 8 inches deep on any segment greater than 10 feet.
Cultural Resources	Any measurable impact to documented sites, based on condition assessment every 5 years.

Management Tools to Respond to Monitoring of Improved Trails

Table 2-5 lists the tools that may be used to manage ORV use when necessary in response to decreased trail tread utility and associated impacts. These tools are arranged in rough order from the least restrictive to the most restrictive. There would be no implication that the tools must be tried in the listed order and a failure elicited before trying the next one.

Table 2-5. Alternative 4 and 5 Management Tools That May Be Used to Manage ORV Use in Response to Conditions indicating Decreased Trail Tread Utility or the Start of Multiple Alignments

Trail Maintenance	Trail maintenance would be targeted at the specific problem area.
Limitation of Recreational ORV Use	If degradation levels are exceeded on trails designated for recreational ORV use, number of recreational ORV permits issued for that trail would be reduced to a level commensurate with the trail's ability to maintain one alignment. Permits would be reduced by 20% annually until monitoring showed improvement.
Temporal Restrictions	The NPS would restrict access at particular times of year based upon surface conditions.
Closures	Using the appropriate authorities, the NPS would close areas of the park to ORV use or to specific types of access until conditions stabilize or recover. Area closures would be delineated utilizing wetland mapping and identifying those areas most susceptible to resource impacts.

2.4.5 Alternative 5 (Preferred Alternative)

Overview

This alternative would improve most degraded segments of the nine trails to a design-sustainable or maintainable condition in order to provide reasonable access while protecting park resources. This would result in 58.5 miles of trail being improved. On unimproved trails or trail segments, impact standards would be applied to ensure that resource impacts do not expand, that unimproved trail segments improve in condition over time, and that unmanaged proliferation of trails is minimized.

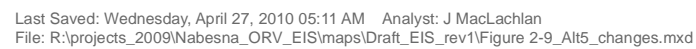
The proposed changes to the trail system and the allowable uses under Alternative 5 are shown in Figures 2-9 and 2-10, respectively.

Once trails are improved to at least a maintainable condition, this alternative would permit recreational ORV use on both National Park and National Preserve trails. Recreational ORV use would not be permitted on 7.3 miles (8 percent) of the trails. Subsistence ORV use would continue on improved and unimproved trails, subject to monitoring/management actions described below.

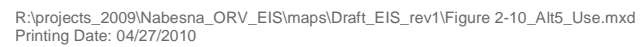
Trail Improvements and Maintenance

The following trail improvements (shown in Figure 2-9) would occur:

- **Lost Creek trail:** A single trail alignment would be bladed up the existing gravel route to consolidate travel and minimize stream crossings. Improvements would result in a maintainable trail.
- **Trail Creek trail:** A single alignment would be bladed up the existing gravel route to consolidate travel and minimize stream crossings. Improvements would result in a maintainable trail.
- **Suslota trail:** This trail would remain unimproved except for GeoBlock installation at two severely degraded trail segments, bridge and puncheon installation at creek crossing SLT-3, and re-routing to a naturally hardened crossing at SLT-1 (See Figure 2-11).
- **Caribou Creek trail:** Improvements would consist of major trail hardening utilizing local gravel sources and/or other trail-hardening methods, re-alignment of creek crossings, re-alignment of a sidehill traverse, and re-grading of the upper portion of the trail. These improvements would result in a maintainable trail.
- **Soda Lake Re-route:** A re-route would be constructed from Lost Creek to Platinum Creek to avoid private property. This re-route would also by-pass most of the trail segments currently classed as degraded or very degraded. These improvements would result in a 7-mile segment of design-sustainable trail along the new upland segment and 5 miles of maintainable trail along floodplain portions for the balance of the alignment. Once the re-route is completed, the old trail would be seasonally closed to all motorized users (except those accessing private land) to allow for vegetation and soils recovery.
- **Reeve Field Re-route:** A re-route would be constructed utilizing an old road alignment. This alignment does not meet sustainable design guidelines. Some areas of trail hardening would be required. This re-route would by-pass all trail segments currently classed as degraded, very degraded, or extremely degraded. Bridges suitable for ORV passage would be constructed at both Jack Creek crossings. These improvements would result in a maintainable trail. Once the re-route is completed, the old trail section would be seasonally closed to all motorized users to allow for vegetation and soils recovery.
- **Tanada Re-route:** The trail would be re-constructed to the wilderness boundary. For the first 10 miles, re-construction would consist of spot hardening approximately 1.3 miles in the wettest portions using porous pavement panels or other structural trail hardening method. The other approximately 8.7 miles would be ditched and elevated and/or capped with geotextile and up to 2



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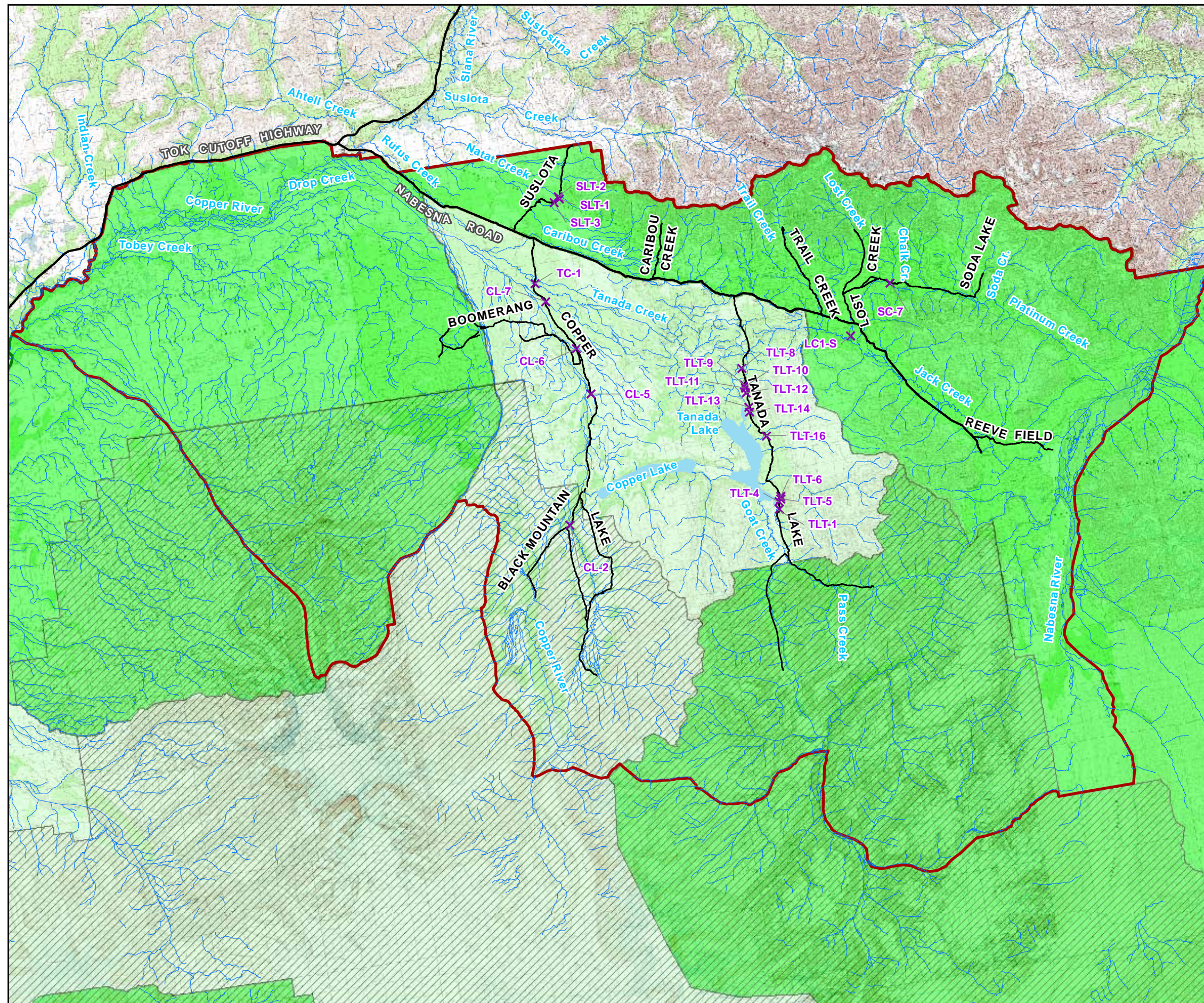
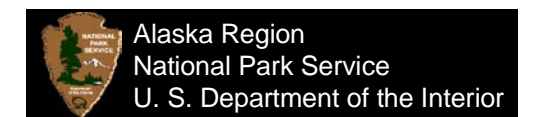
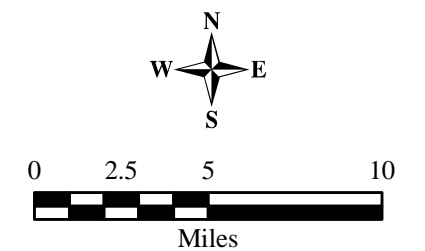


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Figure 2-11
Stream Crossings of Concern

-  Existing Roads
-  Existing Motorized Trails
-  Analysis Area
-  Impacted Crossings
-  Streams
-  Park
-  Park/Wilderness
-  Preserve
-  Preserve/Wilderness

Source: Buncic et al. 2009



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feet of gravel. Re-construction of this segment would require the development of three gravel material sources along the trail. The second segment would consist of a sidehill re-route of the last 6 miles of trail to the wilderness boundary. These improvements would result in sections of design-sustainable and maintainable trail. Re-construction would be done in phases over a 4-year period. Once re-construction is done, old degraded portions of the trail would be closed and allowed to recover.

- **Copper Lake Re-route:** The trail would be re-constructed in segments. The first segment would utilize the old trail alignment to Tanada Creek. This section would be widened and built up with gravel excavated from adjacent ditchlines. Supplemental gravel capping and plank tread would be installed in some locations. The trail re-construction in this segment and a bridge at Tanada Creek would result in a maintainable trail. Past the Tanada Creek crossing additional ditch and cap work would be constructed for approximately 1.5 miles, at which point a descending bench cut would be constructed to access the Copper River floodplain. This second segment would be a trail re-route along the Copper River floodplain to the cutoff trail to Boomerang and then continuing south, utilizing well-drained alluvial gravel soils on elevated terraces along the river floodplain, side-slope bluff bench cuts, some well-drained soils near the top edge of the bluff, and some sections of hardened trail to access Copper Lake. This re-route would result in a design-sustainable trail. South of Copper Lake and into the designated wilderness, improvements would consist of minor re-routes, drainage structures, or spot hardening. All work in designated wilderness would be done using hand crews. An easement across the private property located west of Copper Lake would be a prerequisite to doing any trail improvement on any segment of the Copper Lake or Black Mountain trail system.
- **Boomerang trail:** From the Copper Lake trail there would be an un-improved ford across the Copper River and then improvements made to an existing ramp that climbs out of the active floodplain. No improvements are planned for the rest of the Boomerang trail. This work would result in a maintainable trail section at the ramp.
- **Trail system south of Tanada Lake in the designated wilderness:** These existing trails (Pass Creek and Goat Creek trails) would be improved. Improvements would consist of minor re-routes, drainage structures, or spot hardening. All work in designated wilderness would be done using hand crews.

Once proposed trail improvements are in place, trail maintenance would increase to a level that would correct unsafe situations, correct natural resource damage, and restore trails to planned design standards.

Recreational ORV Use

Once trails are improved to at least a maintainable condition, this alternative would permit recreational ORV use on park trails within the National Preserve and National Park. Because of the costs associated with trail improvements, this alternative would implement a trail use fee. All recreational ORV users would be required to pay a user fee.

Until trail improvements are done, recreational ORV use would not be permitted on trails with any segments in worse than fair condition, as follows:

- **Suslota trail:** Would remain mostly unimproved; recreational ORV use not permitted.
- **Caribou Creek trail:** Mostly in fair or better condition; recreational ORV use permitted.

- Trail Creek trail: Fair or better condition; recreational ORV use permitted.
- Lost Creek trail: Fair or better condition; recreational ORV use permitted.
- Soda Lake trail: Segments in degraded and very degraded condition; recreational ORV use not permitted until proposed re-route alignment is constructed.
- Reeve Field trail: Segments in degraded and very degraded condition; recreational ORV use not permitted until proposed re-route alignment is constructed.
- Tanada Lake trail: Segments in degraded, very degraded, and severely degraded condition; recreational ORV use not permitted until proposed improvements are done. Once improvements are completed, open to recreational ORV use to the congressionally designated wilderness boundary.
- Copper Lake trail: Segments in degraded, very degraded, and severely degraded condition; recreational ORV use not permitted until improvements are done. Once improvements are completed, open to Copper Lake.
- Boomerang trail: Segments in degraded condition. Recreational use not permitted until improvements are completed on the Copper Lake trail to the Boomerang trail turn-off and on the Boomerang trail. Once improvements are completed, open to tracked rig use only.

Subsistence ORV Use

After completion of proposed improvements, trails would be open to subsistence ORV use, subject to the monitoring standards for improved trails described below. Prior to completion of the proposed trail improvements, all trails would be open to subsistence ORV use but would be monitored to ensure that resource impacts associated with unimproved trails decrease over time. If these conditions are not met, based on monitoring, subsistence ORV use on unimproved trails would be subject to management actions as described below under monitoring standards for unimproved trails. On trails where degraded segments are replaced by trail re-construction or re-routes, the old degraded segment will be closed to all ORV use to allow for recovery of vegetation, soils, and wetlands. Otherwise, travel off existing trails outside of designated wilderness would be permitted as long as resource impacts do not occur. To ensure this does not happen, the impact standards identified below for off-trail use will be monitored and if standards are not met newly created trails would be closed.

On the trail systems in the designated wilderness (Black Mountain and the trails south of Tanada Lake), subsistence ORV users would be required to stay on designated trails (Figure 2-10). For wilderness lands outside of the designated trail corridors, this would be accomplished by an area closure under 36 CFR 13.460(b). Prior to trail designation, trail improvements as described above would occur. Under this alternative, an increase of subsistence ORV use is anticipated to and into the designated wilderness. Trail designation is included in this alternative to halt proliferation of user-created trails and to minimize impacts to the undeveloped character of the designated wilderness.

Non-motorized Trails or Routes

The following non-motorized trails or routes (shown on Figure 2-9) would be constructed or laid out:

- Platinum-Soda route: Links Upper Platinum to Soda Lake

- Platinum-Reeve route: Links lower Platinum Creek to the Reeve Field trail
- Sugarloaf route: Links the Skookum Volcano trail to Tanada Lake
- Tanada Spur trail: Trail from the improved Tanada Lake trail to Tanada Lake
- Wait-Nabesna route: Route from the wilderness boundary on the Tanada Lake trail up Goat Creek, up Pass Creek, down Wait Creek, along Jacksina Creek to Nabesna Road
- 4-mile trail: Trail from the 4-mile point on the Nabesna Road to the Copper River
- Mentasta traverse: Trail from the end of Caribou Creek trail to Soda Lake
- Rock Creek trail: Links the Nabesna Road up Rock Creek to the Mentasta traverse.

A total of 76.9 miles of non-motorized routes or trails would be added.

Monitoring Standards

Unimproved Trails

This alternative would leave the following trails or trail segments unimproved:

- Most of Suslota trail
- Boomerang trail west of the ramp out of the Copper River

Recreational ORV use would not be permitted on these trails or trail segments, with the exception of Boomerang trail, which would be open to tracked rigs only. They would be open to subsistence ORV use and ORV use for accessing inholdings, subject to the standards listed below.

Table 2-2 presents the resource, impact indicators and standard/action level for unimproved trail segments. If monitoring indicates that standards are not being met and the magnitude or degree of resource impacts is increasing over time, action would be taken to address the problem through management of subsistence ORV use. Actions would be limited to only those trails showing increased resource impacts.

For any specific trail, exceeding the standard on three of more of the eight measured indicators would result in management action to correct the problem.

Management Tools to Respond to Monitoring of Unimproved Trails

Table 2-3 lists the tools that may be used to manage subsistence and inholder ORV use when necessary in response to unacceptable impacts. These tools are arranged in rough order from the least restrictive to the most restrictive. There would be no requirement that the tools must be tried in the listed order and a failure elicited before trying the next one.

Improved Trails

Once trails are improved, they would be monitored to ensure that they maintain tread utility and therefore one trail alignment. Table 2-4 presents a set of impact standards for several indicator

categories. Monitoring would take place every 5 years and would occur through the use of general observations along improved portions of trails, rather than at fixed transect points. Not meeting any of the five impact standards on an improved trail section would result in management actions being taken for that specific trail.

Management Tools to Respond to Monitoring of Improved trails

Table 2-5 lists the tools that may be used to manage ORV use when necessary in response to decreased trail tread utility and associated impacts. These tools are arranged in rough order from the least restrictive to the most restrictive. The Park Superintendent would select 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.

Off-trail ORV use

Subsistence ORV use off of existing trails is permitted as long as the use does not result in creation of new trails or resource impacts. In order to ensure this does not happen, the impact standards identified in Table 2-6 for off-trail use would be monitored every 3 years and if standards for any impact indicator are exceeded newly created trails would be closed. If multiple (greater than three) spur trail closures occur along an existing trail, the trail will be considered for designation, with no off-trail ORV travel permitted.

Table 2-6. Alternative 5 Off-Trail Indicators and Standards

Resource	Impact Indicator	Standard and Action Level
Wetlands/Visuals	Braiding	Evidence of multiple parallel passes.
Soils/Visuals	Soil compaction	Visible ruts that are greater than 3 inches deep along any 50-foot segment.
Soils	Soil erosion	Any evidence of active transport erosion caused by off-trail ORV use.
Soils/Visuals	Soil churning, subsidence	Any large, single, deep water and mud-filled hole that alters travel.
Vegetation/Visuals	Bare ground	Perforation or removal of organic mat on any 50-foot segment.
Fish Habitat	Stream crossings	Any of the following are occurring at off-trail stream crossings: 1) use of crossing could lead to direct destruction of spawning habitat; 2) crossing is causing a direct impediment to fish passage; or 3) crossing is causing sedimentation directly or indirectly into a waterbody that is fish-bearing.

2.5 Mitigating Measures

Cultural Resources: The nine existing trails (Suslota, Caribou Creek, Trail Creek, Lost Creek, Soda Lake, Reeve Field, Tanada Lake, Boomerang, and Copper Lake (to the wilderness boundary) have been surveyed for cultural resources. Any trail re-construction or construction that occurs outside of the 50-foot surveyed corridor would be surveyed prior to construction taking place.

The trail systems in the designated wilderness (Black Mountain trail system and trail system south of Tanada Lake) have not been surveyed for cultural resources. Prior to any trail improvements or prior to designation of specific trails, cultural resource surveys would take place.

2.6 Environmentally Preferred Alternative

The NPS is required to identify the environmentally preferred alternative in its NEPA documents for public review and comment. The NPS, in accordance with the DOI policies contained in the

Department Manual (516 DM 4.10) and the Council on Environmental Quality's Forty Questions, defines the environmentally preferred alternative as the alternative that best promotes the national environmental policy expressed in NEPA (Section 101(b)) (516 DM 4.10). The Council on Environmental Quality's Forty Questions (Q6a) further clarifies the identification of the environmentally preferred alternative, stating, "simply put, this 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 5 is the environmentally preferred alternative because it improves most trails to one maintainable alignment, thereby minimizing off-trail travel and allowing recovery of degraded soils, vegetation, stream crossings, and wetlands associated with damaged trails. By reducing off-trail travel, it also protects undocumented historic and cultural resources outside of existing trail corridors. Alternative 3 was not chosen as the environmentally preferred alternative because, while it reduces ORV use in the analysis area, it does little to improve trails. Without trail improvements, some resource impacts associated with trails are expected to continue.

2.7 Preferred Alternative

Alternative 5 is the agency's preferred alternative because it best meets the purpose and need of the project as well as the objectives identified in Section 1.1.3. Alternative 5 addresses the resource concerns associated with existing trail condition by improving trails through a combination of re-routes, trail hardening, and trail reconstruction. In doing so, access is provided for backcountry and wilderness activities, which also accommodates subsistence uses and access to private inholdings. Alternative 5 also proposes to enhance non-motorized opportunities in the area.

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 ORV Management Plan/EIS. This section describes the alternatives and actions that were considered and provides justification for their elimination from more detailed study.

The Use of Seasonal Closures as an Alternative. During public scoping commenters suggested the use of temporary ORV trail closures when climatic conditions or excessive soil moisture makes trails susceptible to excessive degradation. Temporary trail closures were eliminated from further analysis for the following reasons:

- This concept would require very intensive monitoring and public notification. Staff would need to assess on a daily basis as conditions on the ground could change within days. Potentially, conditions could change enough to warrant temporary closure when some users are still out in the field.
- In their current condition, some trails might never open, particularly during hunting season (which tends to be the wettest portion of the summer).

The Use of a Major Re-route, Located Between the Current Copper Lake and Tanada Lake Trails. This potential re-route would potentially access both Tanada and Copper lakes and replace the current degraded trails. This idea was examined in the field early during summer 2008. Test pits were dug along some of the drier and higher ground along the route. The route was determined to be unsuitable for trail construction because of high water table, saturated soils, and lack of a suitable substrate for construction (very high organics).

The Use of a Major Re-route for the Suslota Trail, Located West of the Existing Trail. This idea was examined in the field during summer 2009. The area to the west of the existing trail was examined and test pits were dug to assess soils and presence or absence of underlying substrate such as gravel. The route was determined to be unsuitable for trail construction because of high water table, saturated and frozen soils, and very little substrate suitable for construction (sand, silty clay, high organics, and very little gravel).

Construction of Additional Airstrips as an Alternative Means of Access. Construction of additional airstrips within the analysis area was suggested as an alternative means for accessing backcountry and wilderness opportunities. This idea was eliminated from detailed study for the following reasons:

Numerous remote landing strips and lakes suitable for float plane landing already exist within the analysis area (see Figure 2-3).

The cost of building and maintaining an airstrip in remote locations is prohibitive.

The Use of Specific Trail Hardening Materials Such as Corduroy or Chain-Link Fence. These materials were suggested in public meetings as cost-effective methods for hardening trail. The application of chain-link fence as a trail hardening material, depicted in Figure 2-12, has been tried in other places in Alaska. It is problematic for the following reasons:

- Difficult to install over an uneven surface (such as tussocks).
- Difficult to anchor (with pressure, chain link tends to break over time).
- Tends to sink/disappear in deep mud holes.
- Pressure of ORVs in the middle tends to curl up the edges (see photo), creating major potential problems for hikers, wildlife, or snowmachines.

Poor weight distribution characteristics and limited benefit in protecting surface vegetation.

Corduroy: The NPS tested corduroy as one trail-hardening technique in a Wrangell-St. Elias study (Allen et al. 2000). Labor intensity and cost of corduroy installation are dependent on an abundant source of poles being available along the trail. Three to four poles are required for every linear foot of 6-foot-wide trail. Good sources of pole material are rare along most segments of the nine trails considered in this EIS, particularly along the degraded segments that would require their installation. Bringing in poles would be cost-prohibitive. Corduroy, unless buried also has a short service life, particularly in relationship to the cost of installation. Corduroy may be considered in small segments.

2.9 Summary and Comparison of Alternatives

Table 2-1 provides a comparison of the components of the five alternatives. Table 2-7 provides a comparison of the environmental effects of the alternatives based on the impact analysis documented in Chapter 4 of the Plan/EIS.



Figure 2-12. Photograph of Chain-link Fence as Trail Hardening Material.

Table 2-7. Summary Table of Environmental Consequences

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Soils	<p>Continued subsistence ORV use without trail improvement would result in major impacts to soils on the Tanada Lake, Copper Lake, and Suslota trails. Continued recreational and subsistence ORV use on the other unimproved trails would result in moderate to negligible impacts to soils because these trails occur on better soils.</p> <p>This alternative would have moderate direct, indirect, and cumulative effects on soils.</p>	<p>Continued recreational and subsistence ORV use without trail improvement would result in major impacts to soils on the Tanada Lake, Copper Lake, and Suslota trails and moderate impacts on the Caribou Creek, Soda Lake, Reeve Field, and Boomerang trails. Existing degraded trail segments would experience more severe soil impacts and an expansion of impacts from increased trail braiding.</p> <p>This alternative would have major direct, indirect, and cumulative effects on soils.</p>	<p>Re-routing degraded portions of the Soda Lake trail, implementing a monitoring and management program, and closing trails to recreational ORV use would slow the ongoing adverse impacts to soils. Continued subsistence ORV use subject to monitoring and management actions, without trail improvement would result in moderate impacts to soils on Tanada Lake, Copper Lake, and Suslota trails; minor impacts to soils on Black Mountain, Boomerang, Caribou Creek, and Reeve Field; and negligible impacts to soils on the gravel-bedded Lost Creek and Trail Creek.</p> <p>Overall, the adverse impacts to soils under Alternative 3 would be moderate. Impacts would occur over moderately sized areas and at multiple locations but contained within the original site of disturbance.</p>	<p>Improving eight trails to allow ORV users to stay on one trail alignment, closing old degraded trail segments to allow for partial recovery, and implementing monitoring and management actions would largely reverse ongoing adverse impacts to soils. Impacts to soils resulting from trail construction and reconstruction would be localized and offset by closure/recovery of old degraded trail segments. Continued ORV use with trail improvements would result in minor impacts to soils on Black Mountain, Boomerang, Caribou Creek, Copper Lake, Reeve Field, Tanada Lake, and Soda Lake trails; and negligible impacts to soils on the gravel-bedded Lost Creek and Trail Creek. Because of monitoring efforts that would contain existing impacts, slightly increased ORV use on the unimproved Suslota trail would result in minor impacts to soils.</p> <p>Overall, the adverse impacts to soils under Alternative 4 would be minor.</p>	<p>Improving all nine trails and implementing monitoring and management actions would largely reverse ongoing adverse impacts to soils. Designation of trails in the wilderness for subsistence ORV users, combined with off-trail monitoring, would minimize off-trail soil impacts. Trail construction and reconstruction would result in localized impacts to soils, offset by the recovery of old degraded trail segments. Continued ORV use with trail improvements would result in minor impacts to soils on Black Mountain, Boomerang, Caribou Creek, Copper Lake, Reeve Field, Tanada Lake, Soda Lake, and Suslota trails; and negligible impacts to soils on the gravel-bedded Lost Creek and Trail Creek.</p> <p>Overall, the adverse impacts to soils under Alternative 5 would be minor.</p>

Table 2-7. Summary Table of Environmental Consequences

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Trail Condition	<p>Alternative 1 would result in continued deterioration, or moderate, long-term adverse effects to trail conditions. Changes to existing trail conditions would occur in response to expected increases in ORV use with no trail improvements. Trail segments currently classified as degraded could experience expanded trail braiding. Some segments currently classified as fair might become degraded. Trails dominated by degraded conditions (such as the Suslota, Tanada Lake, and Copper Lake trails) would continue to meet the threshold criterion for long-term, major impacts; trails that are currently in good to fair condition due to favorable tread characteristics (Lost Creek and Trail Creek) would meet the negligible criteria; and the balance (Soda Lake, Reeve Field, Boomerang, Caribou Creek, and the wilderness trail systems) would meet the moderate criteria with some sections crossing the major threshold.</p>	<p>Alternative 2 would result in the continued deterioration, or major, adverse effects, to trail conditions. Changes to existing trail conditions would occur in response to expected increases in ORV use with no trail improvements. Trail segments currently classified as degraded condition would experience expanded degradation, and some segments currently in fair condition would become degraded. Because the Suslota, Copper Lake, and Tanada Lake trails are currently dominated by degraded conditions and total ORV use on these trails would more than double over the planning period, these trails would continue to meet the criterion for long-term, major impacts.</p> <p>The overall condition of the trail system and individual trails would likely change incrementally.</p>	<p>Despite a reduction in overall ORV use, Alternative 3 would result in minor to moderate adverse effects to trail conditions. Without trail improvement, ORV use levels less than current ORV use levels would result in moderate impacts to trail conditions on Suslota, Tanada Lake, and Copper Lake trails, negligible impacts on Lost Creek and Trail Creek trails, and minor impacts on Reeve Field, Boomerang, Caribou Creek, and the wilderness trail systems, with some sections crossing the moderate threshold. The Soda Lake re-route would result in a good condition trail, thus providing a long-term benefit.</p>	<p>This alternative allows both recreational and subsistence ORV use on some trails in the preserve while addressing resource damage from deteriorated trail conditions. The trail improvements would address the deterioration in trail conditions, improving conditions on most trails to a maintainable level while accommodating increased future use. Trail segments along the Suslota Trail classified as degraded would likely remain in that condition, even though recreational ORV use would no longer be permitted.</p> <p>The overall condition class for the trail system and the other individual trails would likely improve substantially relative to current conditions, resulting in potential short-term and long-term beneficial impacts.</p>	<p>This alternative allows both recreational and subsistence ORV use on improved trails while addressing resource damage from deteriorated trail conditions. The trail improvements included in Alternative 5 would address the deterioration in trail conditions, improving conditions on the trails to a maintainable level while accommodating increased future use. This would be subject to monitoring to ensure future performance.</p> <p>The overall condition class for the trail system and for individual trails would likely improve substantially relative to current conditions, resulting in short-term and long-term beneficial effects.</p>

Table 2-7. Summary Table of Environmental Consequences

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Wetlands	<p>Continued subsistence ORV use without trail improvements would allow trails to continue moving into previously undisturbed areas, altering the function and characteristics of wetland communities along the Copper Lake, Tanada Lake, and Suslota trails. Continued recreational and subsistence ORV use on the other unimproved trails and continued subsistence ORV use on the Black Mountain trails would result in moderate to negligible impacts to wetlands because these trails pass through fewer wetlands (i.e., fewer than 30 acres of wetlands would be impacted on these trails).</p> <p>This alternative would have moderate direct, indirect, and cumulative effects on wetlands.</p>	<p>The trails experiencing the greatest extent of trail braiding (Suslota, Tanada Lake, and Copper Lake trails) would be open to both recreational and subsistence ORV and would experience a 100 % increase in ORV use over current conditions. The result would be an increase in the extent and severity of trail braiding, which would impact new previously undisturbed areas and result in major impacts to wetlands along these trails. Other trails in the area with segments that cross wetlands (Soda Lake, Reeve Field) would experience moderate impacts because ORV use levels would not increase significantly. In addition, no recovery of impacted trails would occur.</p> <p>Based on the likely continuation of trail braiding into previously undisturbed wetland communities, and the lack of wetland recovery, Alternative 2 would result in major, long-term, adverse effects to wetland resources.</p>	<p>Impacts to wetlands would be less than those experienced under Alternatives 1 and 2, due to reduced ORV use, one trail improvement, and the implementation of the monitoring and management actions described in Section 2.4.3. Closing trails to recreational ORV use would minimize future wetland impacts by reducing the likelihood of trail braiding. Subsistence ORV use along unimproved segments through emergent or scrub-shrub wetlands along Black Mountain, Suslota, Tanada Lake, and Copper Lake trails would result in moderate impacts to wetlands. Impacts to wetlands would be minor on Boomerang trail, Caribou Creek, Reeve Field, and Soda Lake trails, and negligible on Lost Creek and Trail Creek trails, due to reduced ORV use and smaller areas of sensitive wetlands.</p> <p>Based on the potential for moderate impacts along the most degraded trails, (Suslota, Tanada Lake, and Copper Lake), Alternative 3 would result in moderate, long-term, adverse effects to wetland resources.</p>	<p>Because all but one trail would be improved to at least a maintainable condition and a monitoring and management program would be implemented to prevent impacts from expanding, additional trail widening and braiding would be minimal or non-existent. Some limited impacts would occur to wetlands from construction of trail re-routes and improvements; however, the effects would likely only be perceptible in small, localized areas and last only the duration of construction activities.</p> <p>Therefore, Alternative 4 would have a net, long-term, minor adverse impact to wetland resources.</p>	<p>Because most trails would be improved to at least a maintainable condition and a monitoring and management program would be implemented to prevent impacts from expanding, it is expected that future trail widening and braiding would be minimal. Designation of trails for subsistence ORV users in wilderness and off-trail monitoring and management actions would minimize off-trail impacts to wetlands. Limited, short-term impacts would occur to wetlands during construction, although the effects would be perceptible in small, localized areas and last only the duration of construction activities. Impacts to wetlands resulting from Tanada Lake trail improvements would be minor because 4.8 acres of wetlands would be disturbed, allowing approximately 222 acres of wetlands to partially recover by maintaining one trail alignment.</p> <p>Therefore, Alternative 5 would have a net, long-term, minor adverse impact to wetland resources.</p>

Table 2-7. Summary Table of Environmental Consequences

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Vegetation	<p>Continued subsistence ORV use without trail improvements would allow trails to continue moving into previously undisturbed areas, resulting in moderate, long-term, adverse impacts to vegetation along the Copper Lake, Tanada Lake, Black Mountain, and Suslota trails. The lack of trail improvements combined with the continued recreational and subsistence ORV use on Caribou Creek, Reeve Field, and Soda Lake trails, would result in moderate adverse impacts to vegetation. Because of very limited use (13 round trips per year), impacts along Boomerang trail would be contained within the existing trail footprint, and minor. Without trail improvements, trail widening would continue to occur within low shrub and herbaceous communities (even on trails closed to recreational ORV use), resulting in long-term impacts to previously undisturbed vegetative communities.</p> <p>This alternative would have a net moderate long-term, adverse impact on vegetation.</p>	<p>Continued recreational and subsistence ORV use with no trail improvements would allow trails to continue moving into previously undisturbed areas, resulting in major, long-term, adverse impacts to vegetation along the Copper Lake, Tanada Lake, and Suslota trails. The lack of trail improvements and the lack of vegetative recovery associated with trail closures, combined with the continued ORV use on the Black Mountain, Caribou Creek, and Soda Lake trails, would result in moderate adverse impacts to vegetation. Impacts along Boomerang and Reeve Field trails would be localized, and minor, with few ORV round trips per year. Impacts on Lost and Trail Creek would be minor. These trails are located on gravel floodplains with very little vegetation. Because of the major impacts on Copper Lake, Tanada Lake, and Suslota trails, this alternative would have a net major, long-term, adverse effect on vegetation.</p>	<p>Construction of the Soda Lake re-route would result in direct impacts to vegetation over a small area but would allow vegetation recovery in old, degraded portions of the trail. Although the monitoring and management system would prevent the expansion of impacts, moderate impacts to vegetation would occur along Black Mountain, Copper Lake, Suslota, and Tanada Lake trails because of the lack of trail improvements and continued subsistence ORV use on these degraded trails. Impacts to vegetation would be minor along Boomerang, Caribou Creek, Lost Creek, Reeve Field, Soda Lake, and Trail Creek trails, due to reduced ORV use, fewer degraded areas, and monitoring and management program. Because of the continued ORV use of some trails at levels that could result in long-term impacts, the direct and indirect impacts to vegetative resources under this alternative would be moderate.</p>	<p>Trail improvement activities would directly impact 119.5 acres of vegetation in the short term but would allow ORV users to stay on one trail alignment and therefore minimize impacts to vegetation in the long term. Minor impacts to vegetation would occur along Black Mountain, Boomerang, Caribou Creek, Copper Lake, Lost Creek, Reeve Field, Soda Lake, Tanada Lake, and Trail Creek trails because of trail improvements and monitoring and management program. Impacts to vegetation from ORV use would be minor along the Suslota trail due to the monitoring and management program, which would prevent the expansion of impacts. In addition, the total net acreage of vegetation impacts would be less than current conditions due to a recovery of vegetation that is located along trails that would be closed (i.e., re-routed around) or improved.</p> <p>Alternative 4 would have a net minor impact to vegetation resources.</p>	<p>Trail improvement and construction would directly impact 139.5 acres of vegetation in the short term but would result in long term benefits by allowing ORV users to stay on one trail alignment, thus preventing the expansion of impacts associated with trail braiding or off-trail use. Minor impacts to vegetation would occur along Black Mountain, Boomerang, Caribou Creek, Copper Lake, Lost Creek, Reeve Field, Soda Lake, Suslota, Tanada Lake, and Trail Creek trails because of trail improvements and monitoring and management program. Designation of trails for subsistence ORV use in the wilderness and monitoring of off-trail impacts in all areas would minimize off-trail impacts on vegetation. The total net acreage of vegetation impacts would be less than current conditions due to a recovery of areas that are located along trails that would be closed (i.e., re-routed around) or improved. Alternative 5 would have a net minor, adverse impact to vegetation.</p>

Table 2-7. Summary Table of Environmental Consequences

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Water Quality and Fish Habitat	<p>Alternative 1 would result in long-term, moderate, adverse effects on water quality and fish habitat because of localized effects on spawning gravels from sediment runoff and trail-stream crossings, particularly on potential crossing of Chinook salmon spawning areas on Tanada Creek. Multiple ORV stream crossings, particularly on the Tanada Lake, Copper Lake, and Suslota trails, would continue to cause adverse effects to sediment runoff and riparian vegetation along these trails with overall moderate impacts to the aquatic resources. Effects on viability of fish populations are unlikely.</p>	<p>Increased ORV use and unimproved trails would result in long-term, moderate, adverse effects on water quality and fish habitat because of localized effects on spawning habitat from sediment runoff and trail-stream crossings particularly on potential crossing of Chinook salmon spawning areas on Tanada Creek. Multiple and increasing ORV stream crossings, particularly on the Tanada Lake, Copper Lake, and Suslota trails, would continue to cause adverse effects to sediment runoff and riparian vegetation along these trails with overall moderate impacts to the aquatic resources. Effects on viability of fish populations are unlikely.</p>	<p>Alternative 3 would result in long-term, moderate, adverse effects to water quality and fish habitat because of continued (although reduced) ORV use and lack of corrective actions at impacted trail-stream crossings. Multiple ORV stream crossings, particularly on the Copper Lake, Tanada Lake, and Suslota trails, would continue to cause adverse effects to sediment runoff and riparian vegetation along these trails, but because of the monitoring program, these effects to aquatic resources would be minor. Because spawning gravels might be disturbed, impacts to Chinook salmon spawning areas from sediment and disturbance at the Tanada Creek crossing would be moderate. While localized spawning habitat degradation may occur in other areas, it is unlikely to affect the viability of fish populations.</p>	<p>Alternative 4 would result in minor effects on water quality and fish habitat because of trail improvements, re-routes around impacted trail-stream crossings, and other corrective actions at impacted trail-stream crossings. The re-route of the Tanada Lake trail and the bridge installation at the Copper Lake trail crossing of Tanada Creek, ORV use along those trails would result in minor impacts to aquatic habitat. Multiple impacted crossings would remain on Suslota trail (three) and on Copper and Black Mountain trails (three). Increased ORV use over these crossings could contribute sediment and reduce riparian vegetation, but impacts would be minor because of corrective actions on Copper Lake and Black Mountain trails and monitoring and corrective actions on all of these trails. Impacts on other trails would be minor because of trail improvements and corrective actions at impacted crossings. Effects on viability of fish populations or substantial spawning habitat degradation at multiple habitats would not occur.</p>	<p>Alternative 5 would result in minor, adverse effects to water quality and fish habitat because of trail improvements, re-routes around impacted trail-stream crossings, and other corrective actions at impacted trail-stream crossings. Re-routing and improvement of the Tanada Lake trail and the bridge installation on the Copper River trail at Tanada Creek, ORV use along those trails would result in minor impacts to aquatic habitat. Multiple impacted crossings would remain on Copper and Black Mountain trails (three). Increased ORV use over these crossings could contribute sediment and reduce riparian vegetation, but impacts would be minor because of corrective actions and monitoring. Impacts on other trails would be minor because of trail improvements and corrective actions at impacted crossings. Effects on viability of fish populations or substantial spawning habitat degradation at multiple habitats would not occur.</p>

Table 2-7. Summary Table of Environmental Consequences

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Wildlife	<p>The effects of Alternative 1 on wildlife and habitat would be minor. The trails open for ORV use are the same that are currently open, with only a relatively small increase in projected use. Some wildlife would experience short-term adverse impacts from ORVs, but these are unlikely to cause population-level effects. Impacts to habitat would be noticeable, but habitat would retain adequate ecological integrity to support viability of all native species. Continued closure of the Suslota, Tanada Lake, and portions of the Copper Lake trails to recreational ORV use would benefit wildlife by eliminating disturbance during the sensitive breeding season and by not allowing ORVs on unfrozen soil.</p>	<p>Increased ORV use on unimproved trails would result in an expansion of impacts to wildlife habitat, particularly in the vicinity of the Suslota, Tanada Lake, and Copper Lake trails. Because the habitat that these trails traverse is abundant, the impacts to habitat would not result in a loss of ecological integrity and would support viability of all native species. The impact to wildlife habitat is considered minor. Unimproved trails would continue to provide tough and limited access to sport and subsistence hunting. Consequently, impacts to wildlife from increased hunting pressure would be minor.</p>	<p>Closing the area to recreational ORV use would have a beneficial effect on wildlife and wildlife habitat, compared to existing conditions. Reduced ORV access would reduce sport hunting in the area and decrease hunting pressure. Reduced ORV use would reduce the level of habitat impacts, though continued subsistence ORV use on unimproved trails would continue to have a minor impact on wildlife habitat. Construction of the Soda Lake re-route and non-motorized trails would result in minor impacts to wildlife habitat and, because no sport hunting would occur, only a slight increase in subsistence hunting pressure.</p> <p>Overall, this alternative would result in minor impacts to wildlife and wildlife habitat.</p>	<p>This alternative would result in increased hunting pressure, due to the near-doubling of predicted trail users on improved trails. Trail improvements in currently degraded areas could serve to more evenly distribute hunting pressure, but the higher number of users and new access areas currently accessible through non-motorized means would increase hunting impacts on wildlife. This alternative would also result in increased short-term disturbances to wildlife over current levels due to trail construction and maintenance, but these activities would also improve habitat conditions over the long term.</p> <p>Overall, the substantial increase in projected ORV use and increased access to game species would result in long-term, adverse, and moderate impacts to wildlife.</p>	<p>Due to improved trails and the substantial increase in projected ORV users, hunting pressure on wildlife would increase, particularly on Dall's sheep south of Tanada Lake and in the Black Mountain area and on Dall's sheep in some portions of the Mentastas. With the increased miles of trails available, this increased number of users would be somewhat dispersed throughout the area, possibly reducing hunting pressure in some areas. Wildlife would benefit from habitat improvements due to the improved trail condition, recovery of old degraded portions of trails, maintenance of the single trail alignment, and continued monitoring and maintenance activities to ensure that impacts associated with unimproved trails do not expand. Disturbance caused by construction, monitoring, and maintenance activities would be infrequent and localized. Wildlife could move away from affected areas.</p> <p>Overall, the substantial increase in projected ORV use and increased access to game species would result in long-term, adverse, and moderate impacts to wildlife.</p>

Table 2-7. Summary Table of Environmental Consequences

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Scenic Quality	<p>This alternative would result in minor direct and indirect impacts to scenic values in the park, primarily because of localized trail deterioration evident to some viewers. From the air, visitors could experience a minor adverse effect because the trails would not be improved and trail braiding would continue. Trail users would experience similar effects, while changes to scenic quality experienced by visitors in the Nabesna Road corridor (the largest viewer group) would be negligible.</p>	<p>This alternative would result in minor direct and indirect impacts to scenic values in the park, primarily because of localized trail deterioration evident to some visitors, particularly along the Copper Lake, Reeve Field, Suslota, and Tanada Lake trails. Visitors traveling by air or on the trails open to motorized use would experience a minor adverse effect because the trails would not be improved and trail braiding would continue, with associated incremental effects on scenic quality. Visitors in the Nabesna Road corridor would experience negligible changes in scenic quality.</p>	<p>This alternative would result in few new adverse impacts from trail development actions, and existing effects on scenic quality may diminish somewhat because of reduced overall ORV use. Lost Creek trail users could be exposed to views of land disturbance during construction of the Soda Lake Re-route, and construction activity for the Rock Creek non-motorized trail might be evident from the Nabesna Road; these actions would only affect about 12.8 acres and the disturbance would be limited in duration. From the air, visitors could experience negligible to minor adverse effects because the existing trails would be maintained in their current condition and some new trail mileage would be developed. Under Alternative 3, users of the motorized trails in general would experience a corresponding decrease in scenic quality impacts if changed ORV use levels resulted in gradual long-term recovery of some existing degraded trail segments.</p>	<p>Trail improvements and construction would result in short- and long-term impacts to scenic values. Some of these impacts (less scarring because of trail improvements and relocations) would be beneficial and other impacts (visibility of construction disturbance and/or the permanent trail features) would be minor and adverse. Overall, these impacts would be minimal based on the extent of trail improvements and new trail construction or routing. Additionally, the trail improvements would result in minor, adverse impacts to the natural landscape. Park Visitors could be temporarily exposed to limited views of land disturbance (up to 119.5 acres, although visibility of that much acreage is not anticipated) during trail improvements and construction of the non-motorized trails. From the air, visitors would experience negligible to minor, short-term adverse effects. Overall, the long-term effects for both trail users and visitors traveling by air could be positive.</p>	<p>Trail improvements and construction would result in some degree of long-term impacts to scenic values. Some impacts would be beneficial, such as reduction in scarring because of trail improvement and relocations. Other impacts would be adverse, including disturbance to viewsheds because of construction disturbance and/or the permanent trail features. As shown in the simulation for the proposed Mentasta Traverse, there would be negligible, adverse impacts to the natural landscape. Park visitors could be exposed to temporary views of land disturbance during trail improvements and construction of the non-motorized trails which would affect up to 139.2 acres. From the air, visitors also would experience a minor, short-term adverse effect. Overall, the long-term effects for both trail users and visitors traveling by air could be positive. This alternative would result in at most minor, adverse direct and indirect impacts to scenic values in the park primarily due to the addition of several non-motorized trails and a number of motorized trail improvements.</p>

Table 2-7. Summary Table of Environmental Consequences

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Cultural Resources	The effects of Alternative 1 on cultural resources would be minor to moderate because of potential disturbance to currently unknown and unrecorded cultural resources associated with off-trail use outside of surveyed trail corridors and potential disturbance to known and unknown sites associated with continuing ORV use on degraded trails.	Even though no new re-routes are developed, the effects of Alternative 2 on cultural resources would be minor to moderate because of increased ORV use and the potential disturbance to currently unknown and unrecorded cultural resources associated with off-trail use outside of surveyed trail corridors and potential disturbance to known and unknown sites associated with continuing and increasing ORV use on degraded trails.	Because of mitigation and avoidance, the proposed motorized Soda Lake trail re-route and construction or development of non-motorized trails and routes under Alternative 3 could result in negligible to minor, adverse impacts on cultural resources. Continuing ORV use on degraded trails could result in negligible or minor impacts to cultural resources. Indirect impacts from ORV use would be reduced with reduced overall ORV use (37 percent less under Alternative 3 than current levels), resulting in overall minor impacts to cultural resources under Alternative 3.	Despite mitigation measures that would avoid direct impacts, the proposed re-routes of Copper Lake, Reeve Field, Soda Lake, and Tanada Lake trails and the construction or development of non-motorized trails and routes under Alternative 4 would have the potential to adversely affect cultural resources by increasing access to previously undisturbed areas. Combined with the increased level of ORV use and no constraints on off-trail use for subsistence ORV users, adverse impacts to cultural resource sites would be minor with a potential for moderate impacts.	Despite mitigation measures that would avoid direct impacts, the proposed improvements of Copper Lake, Reeve Field, Soda Lake, and Tanada trails and the construction or development of non-motorized trails and routes would have the potential to adversely affect cultural resources by increasing access to previously undisturbed areas. Adverse impacts to cultural resources would be minor with a potential for moderate impacts.
Subsistence	Minor increases in hunting pressure that would occur due to continuing trends in ORV use would not result in long-term decreases in any wildlife population. Continued ORV use would result in minor, localized reductions in access due to trail degradation. A minor increase in competition for subsistence resources would also occur due to the anticipated increases in recreational ORV users over the planning period. Alternative 1 would have minor direct, indirect, and cumulative effects on subsistence resources.	Minor increases in hunting pressure that would occur due to continuing trends in ORV use would not result in long-term decreases in any wildlife population. Continued subsistence and recreational ORV use would result in minor, localized reductions in access due to trail degradation. A minor increase in competition for subsistence resources would also occur due to the anticipated increases in recreational ORV users over the planning period, particularly in the area south of Tanada Lake. Alternative 2 would have minor direct, indirect, and cumulative effects on subsistence resources.	Recreational ORV use would not be permitted under this alternative. This would decrease hunting pressure in the area and benefit some wildlife populations. Re-routing of the Soda Lake trail and closure of trails to recreational ORV use would result in minor improvements in access due to improvements in trail condition. Closure of trails to recreational ORV users would also result in decreased competition for subsistence resources over the planning period. Alternative 3 would have minor beneficial effects on subsistence resources.	Alternative 4 could cause short-term decreases in subsistence resources due to trail improvements, which would result in substantial increases in subsistence and recreational ORV use accompanied by increased hunting activity. Trail improvements would increase access to and thus competition for subsistence resources over the planning period. Alternative 4 would have moderate direct, indirect, and cumulative effects on subsistence resources.	Alternative 5 could cause short-term decreases in subsistence resources due to trail improvements, which would result in substantial increases in recreational ORV use accompanied by increased hunting activity. Trail improvements would increase access to and competition for subsistence resources over the planning period. Designation of trails for subsistence ORV use in the wilderness would result in a minor restriction on available access. Alternative 5 would have moderate direct, indirect, and cumulative effects on subsistence resources.

Table 2-7. Summary Table of Environmental Consequences

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Wilderness	<p>This alternative would not produce a significant change in existing adverse impacts to wilderness resources. Alternative 1 would continue to allow conditions that result in moderate diminishment of one of the wilderness qualities (undeveloped quality) and negligible effects on a second quality (solitude or primitive and unconfined quality). The alternative would have no effect on the other wilderness qualities (untrammelled quality and natural quality). Overall, including the moderate effect on wilderness character in areas eligible for wilderness designation, Alternative 1 would result in continued conditions that represent a moderate adverse change from natural conditions.</p>	<p>Under this alternative, continued ORV use on unimproved trails would cause moderate adverse impacts to wilderness resources. Alternative 2 would continue to allow conditions that result in moderate diminishment of undeveloped quality and negligible effects on solitude or primitive and unconfined quality within the designated wilderness, and would have no effect on the other wilderness qualities (untrammelled quality and natural quality). Overall, including the minor effect on wilderness character in areas eligible for wilderness designation, Alternative 2 would result in continued conditions that represent a moderate adverse change from natural conditions.</p>	<p>This alternative would not cause significant changes to existing adverse impacts to wilderness resources. With continued subsistence ORV use on unimproved trails, Alternative 3 would continue to allow conditions that result in moderate diminishment of undeveloped quality and negligible effects on solitude or primitive and unconfined quality within the designated wilderness, and would have no effect on the other wilderness qualities (untrammelled quality and natural quality). Overall, including the moderate effect on eligible wilderness character resulting from the Soda Lake re-route, Alternative 3 would result in continued conditions that represent a moderate adverse change from natural conditions.</p>	<p>Under Alternative 4, negligible, adverse impacts to the untrammelled quality and minor adverse impacts to the natural quality would occur related to the proposed trail activities in the designated wilderness. There would be major, adverse effects on the undeveloped quality of wilderness resource values because of the impacts associated with a significant increase in subsistence ORV use and proliferation of unmanaged motorized trails. Total ORV use on trails in and leading to the wilderness would nearly triple. The increase in the level of ORV use in and adjacent to the wilderness area would result in more opportunity for non-motorized wilderness users to encounter sights and/or sounds of motorized traffic, and a decrease in their opportunities for solitude. The result would be a moderate, adverse change from current conditions for this wilderness quality. Overall, including the moderate effect on wilderness character in areas eligible for wilderness designation, Alternative 4 would be expected to result in major impacts to wilderness character. Combined with the moderate level of impact that already exists, this would result in widespread long-term effects to the wilderness character and associated values and reduced integrity of wilderness and a major impact within designated wilderness.</p>	<p>Under Alternative 5, negligible adverse impacts to the untrammelled and natural qualities of wilderness would occur related to the proposed trail activities in the designated wilderness. There would be minor adverse effects on the undeveloped quality of wilderness resource values because of the impacts associated with trail improvement and a beneficial impact associated with requiring ORV users to stay on designated trails. Total ORV use on trails leading to the wilderness would nearly triple. The resulting increase in the level of non-motorized use in the wilderness area would result in more opportunity for wilderness users to encounter sights and/or sounds of other users, and a decrease in their opportunities for solitude. The result would be a moderate, adverse change from current conditions for this wilderness quality. Overall, including the moderate effect on wilderness character in areas eligible for wilderness designation, Alternative 5 would be expected to result in moderate impacts to wilderness character and would result in continued conditions that represent a moderate change from natural conditions.</p>

Table 2-7. Summary Table of Environmental Consequences

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Visitor Opportunities and Access	<p>Opportunities for non-motorized users to access the backcountry on maintainable trails in the analysis area would continue to be quite limited. For non-motorized trail users, Alternative 1 would likely have a minor, adverse increase in the level of impact relative to the existing conditions. This change would occur primarily as a result of continued deterioration of the trail system, and an expected moderate increase in ORV use might contribute slightly to the future impacts. Opportunities for motorized use in general would remain unchanged from current conditions, although three trails would continue to be seasonally closed to recreational ORV use. Overall, Alternative 1 would likely result in minor, adverse impacts to visitor opportunities, access, and experiences for backcountry users.</p>	<p>Alternative 2 would result in continued limitation of opportunities and experience levels for non-motorized users to access the backcountry on maintainable trails, a minor, adverse impact as a result of continued deterioration of the trail system. An expected increase in ORV use might contribute slightly to the future adverse impacts. Opportunities for motorized use would increase because all nine trails would be open to recreational ORV use. Opportunities for frontcountry users who remain in the Nabesna Road corridor and off-trail backcountry users would not likely be directly affected. Overall, this alternative would likely result in minor, adverse impacts to visitor opportunities and experiences for backcountry.</p>	<p>Under Alternative 3 there would be an overall expansion of visitor opportunities and access for non-motorized backcountry users and a substantial decrease in opportunities for motorized users, particularly with removal of opportunities for recreational ORV use. While trail conditions might improve slightly there would be continued limitation of opportunities and experience levels for non-motorized trail use on existing trails from continued deterioration of the trail system, a minor adverse impact. Because of trail closures to recreational ORV use, Alternative 3 is expected to have moderate to major, adverse impacts to visitor opportunities, access, and experiences for recreational ORV users in the analysis area. Conversely, opportunities for non-motorized users to access the backcountry on maintainable trails would be increased substantially through the development of four new non-motorized trails or routes, with a corresponding beneficial impact for this user group. Overall, the net impact for non-motorized trail users is considered beneficial.</p>	<p>Under Alternative 4 there would be an overall expansion of visitor opportunities and access for both motorized and non-motorized backcountry users. Because trail conditions would improve considerably, limitation of opportunities and experience levels from deterioration of the trail system would no longer occur. Opportunities for non-motorized users to access the backcountry on maintainable trails would be increased substantially through the development of seven new non-motorized trails or routes, with a corresponding beneficial impact for this user group. Based on projected increases in total and recreational ORV use levels, Alternative 4 is also expected to have long-term, beneficial impacts overall to visitor opportunities and experiences for recreational ORV users in the analysis area. Alternative 4 is expected to have minor adverse impacts to visitor opportunities and experiences for off-trail backcountry users because of increased ORV use and reduced opportunities for remoteness.</p>	<p>Under Alternative 5 there would be an overall expansion of visitor opportunities and access for both motorized and non-motorized trail users. Because trail conditions would improve considerably, limitation of opportunities and experience levels from deterioration of the trail system would no longer occur. Opportunities for non-motorized users to access the backcountry on maintainable trails would be increased substantially, with a corresponding beneficial impact for this user group. Alternative 5 is also expected to have long-term beneficial impacts to visitor opportunities and experiences for recreational ORV users. Alternative 5 is expected to have minor, adverse impacts to visitor opportunities and experiences for off-trail backcountry users because of increased ORV use reduced opportunities for remoteness.</p>

Table 2-7. Summary Table of Environmental Consequences

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Socioeconomics	Slight increases in subsistence ORV use on the Copper Lake and Tanada Lake trails could have negligible adverse impacts on local businesses because of the reduced wilderness perceptions of visitors toward the lodges/cabins in the vicinity of Copper and Tanada lakes, as well as visitors being transported to drop-off/pick-up points in this area. Increases in recreational and subsistence ORV use would likely be accompanied by corresponding modest increases in related spending at local businesses supporting these uses, a beneficial impact. On balance, because of the projected increases in visitor use and related benefits to local businesses, impacts to socioeconomics under Alternative 1 would be beneficial.	Increases in recreational ORV users accessing Tanada and Copper Lakes could have negligible to minor adverse impacts on local businesses because of the reduced wilderness perceptions of visitors toward the lodges/cabins in the vicinity of Tanada and Copper Lakes, as well as visitors being transported to drop-off/pick-up points in this area. Increases in visitor use would likely be accompanied by corresponding modest increases in related spending at local businesses supporting these uses, a beneficial impact. On balance, because of the projected increases in visitor use and related benefits to local businesses, impacts to socioeconomics under Alternative 2 would be beneficial.	Closure of the nine trails to recreational ORV use would likely have beneficial impacts for wilderness-related businesses because potential negative impacts on the wilderness perceptions of outfitter/guide clients transported via float plane to these areas would be reduced. Impacts to businesses supporting recreational ORV use would likely be minor and adverse, assuming trail closure would result in a corresponding reduction in related local spending. On balance, because of the benefits to businesses that rely on wilderness experiences, impacts to socioeconomics under Alternative 3 would be beneficial.	Trail improvements and corresponding increases in ORV use in and near the wilderness, combined with the absence of off-trail controls for subsistence users could indirectly provide access to drop-off/pick-up points used by transporters and areas currently being hunted by guided groups. Because outfitter/guide clients could view increased ORV use from the air, the demand for hunting outfitter/guide services could decrease over time, a minor, adverse impacts to these types of businesses. Impacts to businesses supporting increased recreational ORV use would likely be beneficial. On balance, because of the projected increases in visitor use and related benefits to local businesses, impacts to socioeconomics under Alternative 4 would be beneficial.	Trail improvements and corresponding increases in ORV use in and near the wilderness could indirectly provide access to drop-off/pick-up points used by transporters and areas currently being hunted by guided groups. This potential minor adverse impact would be partially offset by benefits to these businesses from limiting off-trail use in wilderness areas. Impacts to businesses supporting increased recreational ORV use would likely be beneficial. On balance, because of the benefits to wilderness-related business from limiting off-trail use, and the projected increases in visitor use and related benefits to local businesses, impacts to socioeconomics under Alternative 5 would be beneficial.

Table 2-7. Summary Table of Environmental Consequences

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Natural Soundscapes	<p>This alternative would have minor, adverse impacts to soundscapes because direct, indirect and cumulative impacts would slightly increase over a 20-year period. Some of these actions would minimally increase the frequency of noise intrusions over an extended period of time. While these changes would be detectable through monitoring, it is unlikely that the typical visitor would notice the change. Therefore, the minor impacts to soundscapes would not be anticipated to degrade the quality of the visitor experience or affect biological resources.</p>	<p>This alternative would have minor, long-term, adverse impacts to soundscapes because impacts would slightly increase over a 20-year period. Some of these actions would minimally increase the frequency of noise intrusions area over an extended period of time. While these changes would be detectable through monitoring, it is unlikely that the typical visitor would notice the change. Therefore the minor impacts to soundscapes would not be anticipated to degrade the quality of the visitor experience or affect biological resources.</p>	<p>This alternative would have beneficial direct and indirect impacts to soundscapes because less ORV noise would be anticipated year-round. Subsistence ORV use would slightly increase over the next 20 years, but no recreational ORV use would be allowed, resulting in a projected reduction in total ORV use compared to current conditions. The additional opportunities for non-motorized users could bring additional airplane and vehicle noise as more visitors accessed the area, but these adverse effects on the natural soundscape would not be expected to be more than negligible. Based on the small contribution of ORV noise relative to other noise sources experienced by visitors, the overall level of impact to natural soundscapes would be determined by the expected cumulative impacts. Those are characterized as minor adverse impacts and would not be expected to degrade the quality of the visitor experience or affect biological resources.</p>	<p>This alternative would have minor, long-term, adverse direct and indirect impacts to soundscapes because more ORV noise would be anticipated in the area year-round. Based on the increased number of ORV trips, it is anticipated that the frequency of ORV noise levels would increase, although that change would remain localized to the areas near the motorized trails. Impacts from potential increases in airplane and vehicle noise related to bringing additional non-motorized users to the area would be expected to be negligible. Some of the proposed trail improvement and construction activities would result in short-term, negligible to minor, adverse impacts on the natural soundscape. Based on the small contribution of ORV noise relative to other noise sources experienced by visitors, the overall level of impact to natural soundscape under Alternative 4 would be determined by the expected cumulative impacts. Those are characterized as minor adverse impacts and are not expected to degrade the quality of the visitor experience or affect biological resources.</p>	<p>This alternative would have minor, long-term, adverse direct and indirect impacts to soundscapes because more ORV noise would be anticipated year-round. Based on the increased number of ORV trips, it is anticipated that the frequency of ORV noise would increase, although that change would remain localized in the areas near the motorized trails. Impacts from potential increases in airplane and vehicle noise related to bringing additional non-motorized users to the area would be negligible. Some of the proposed trail improvement and construction activities would result in short-term, negligible to minor, adverse impacts on the natural soundscape. Based on the small contribution of ORV noise relative to other noise sources experienced by visitors, the overall level of impact to natural soundscapes under Alternative 5 would be determined by the expected cumulative impacts. Those are characterized as minor adverse impacts and would not be expected to degrade the quality of the visitor experience or affect biological resources.</p>

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