

APPENDIX A
Impairment Determination

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APPENDIX A

DETERMINATION OF IMPAIRMENT

A determination of impairment is made for each of the resource impact topics carried forward and analyzed in the environmental impact statement for the preferred alternative. The description of park significance in Chapter 1 was used as a basis for determining if a resource is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park, or
- Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park, or
- Identified in the park's general management plan or other relevant NPS planning documents as being of significance.

Impairment determinations are not provided for trail condition, visitor opportunities/access, subsistence, or socioeconomics because impairment determinations relate back to park resources and values. These impact areas are not considered to be park resources or values.

Physical Environment Topics

Soils

Management for healthy soils is not identified as a specific purpose in the establishing legislation of the park and soils are not specifically identified in the park's general management plan as being of significance. Soils are a key component to "continuous intact ecological communities that create visually diverse scenery largely unaffected by humans," which is identified as a significance statement for Wrangell-St. Elias National Park and Preserve.

The preferred alternative proposes to improve all nine trails, re-route and reconstruct very degraded and extremely degraded trail segments, and implement monitoring and management actions that would largely reverse the progression of adverse impacts to soils. 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. The combination of small and localized construction impacts and soil recovery along closed trail segments on Copper Lake, Reeve Field, Tanada Lake, Soda Lake, and Suslota would result in minor adverse impacts to soils.

Overall, the adverse impacts to soils under Alternative 6 would be minor and would not result in impairment because improving all nine trails, re-routing and reconstructing very degraded and extremely degraded trail segments, and implementing monitoring and management actions would largely reverse the progression of ongoing adverse impacts to soils.

Biological Environment Topics

Wetlands

Management for wetlands is not specifically identified as a purpose in the establishing legislation of the park, and wetlands are not specifically identified in the park's general management plan as being of significance. Wetlands are a key component to "continuous intact ecological communities that create visually diverse scenery largely unaffected by humans" which is identified as significant for Wrangell-St. Elias National Park and Preserve.

The preferred alternative would improve degraded trails to at least a maintainable condition and a monitoring/management program would be implemented to prevent impacts from spreading beyond the width of the trail. This would benefit wetlands and allow 375 acres of impacted wetlands to recover. Under this alternative, limited, short-term impacts would occur to wetlands during trail improvements, although the effects would be perceptible in small, localized areas and last only the duration of construction activities. Overall impacts to wetlands from the preferred alternative are minor and would not result in impairment.

Vegetation

Management for vegetation is not specifically identified as a purpose in the establishing legislation of the park and vegetation is not specifically identified in the park's general management plan as being of significance. Vegetation is a key component to "continuous intact ecological communities that create visually diverse scenery largely unaffected by humans," which is identified as a significance statement for Wrangell-St. Elias National Park and Preserve.

Under the preferred alternative, trail improvement and construction would directly impact 173.2 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. This would result in 655 acres of currently impacted vegetation being allowed to recover. Based on these factors, Alternative 6 would have a net minor, long-term, adverse impact to vegetation and would not result in impairment.

Water Quality and Fish Habitat

Fish resources in the region include anadromous species including Chinook and sockeye salmon, and several species of resident fish including Dolly Varden trout, Arctic grayling, burbot, whitefish, sculpin, and a few locally present additional species. Protection of fish habitat and protection of populations of fish are specifically identified as park purposes. Protected salmon habitat is identified as one of the significant resources that defines what is most important about the park's resources and values and is tied to the park purpose. Healthy fisheries are necessary to fulfill the purposes for which the park was established and are key to the natural integrity of the park.

The preferred alternative 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. Effects on viability of fish populations or substantial spawning habitat degradation at multiple habitats would not occur. The percentage of analysis area aquatic habitat that could be affected would be low because most stream reaches in the analysis area are not directly crossed by ORV trails. Minor adverse effects to water quality and fish habitat would not result in impairment.

Wildlife

The principal wildlife concerns in the analysis area are game species; there are no federally listed threatened and endangered species present in the analysis area. Sport hunting is allowed in the National Preserve lands of the park, while subsistence hunting is allowed on both the National Park and Preserve lands. Protection of habitat for, and populations of, wildlife including but not limited to caribou, brown/grizzly bears, Dall's sheep, moose, wolves, trumpeter swans and other waterfowl, and marine mammals is specifically identified as a park purpose. Unimpacted wildlife, unfragmented habitat, and native species are all identified as significant resources that define what is most important about the park's resources and values and is tied to the park purpose. Healthy wildlife habitat and populations are necessary to fulfill the purposes for which the park was established and are key to the natural integrity of the park.

The preferred alternative proposes to improve trails to a maintainable condition and thus correct and minimize impacts associated with wildlife habitat. By closing old degraded portions of trails and allowing some habitat recovery, trail improvements would improve habitat quality for wildlife on all trails. Disturbance impacts to wildlife from ORVs would increase, and individuals could be frequently disturbed during hunting season. Disturbance under this alternative could cause some changes to the demography and distribution of wildlife populations. ORV use, and thus disturbance to wildlife, is projected to increase over current use on Copper Lake and Tanada Lake trails. ORV use also is projected to increase on the other trails. The effects of Alternative 6 on wildlife would be long-term, adverse, and moderate but populations are likely to remain viable, and the ecological integrity of wildlife habitat within the analysis area would remain intact. These effects would not result in impairment.

Human Environment Topics

Scenic Quality

The existing scenic quality of the analysis area remains relatively undisturbed, except for the Nabesna road as well as the multiple trails and trail braids and development (e.g., houses, outbuildings, vegetation clearing) associated with private inholdings along the road. The surrounding scenery is remarkable with its tall peaks. "To maintain unimpaired the scenic beauty and quality of high mountain peaks, foothills, glacial systems, lakes and streams, valleys, and coastal landscapes in their natural state" is identified as a park purpose. Expansive vistas and scenic wildlands are identified as significant resources that define what is most important about the park's resources and values and are tied to the park purpose. Unimpaired scenic quality is necessary to fulfill the purposes for which the park was established and is key to the natural integrity of the park.

Trail improvements and construction under the preferred alternative would result in some degree of long-term impacts to scenic values. Some of these impacts would be beneficial, such as reduction in scarring associated with degraded trails that would result from 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. Visitors to the park potentially would be exposed to temporary views of land disturbance during trail improvements and construction of the non-motorized trails which would affect up to 173.2 acres. From the air, it is anticipated that 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. These minor effects would not result in impairment.

Cultural Resources

Protection of cultural resources is not specifically identified as one of the park's purposes in the establishing legislation of the park. The park's general management plan does identify cultural resources as a significant resource and protection of cultural resources would be key to the natural or cultural integrity of the park.

Under the preferred alternative, mitigation measures would avoid direct impacts along the proposed re-routes of Copper Lake, Reeve Field, Soda Lake, and Tanada Lake trails and the development of non-motorized trails and routes. Cultural resources would benefit from keeping ORV users on one alignment. With the anticipated impacts at the Old Suslota village site at Suslota Lake resulting from improvement of the Suslota trail, impacts to cultural resources would be moderate and adverse. With the applied mitigation of public education and signing, this would not result in impairment of cultural resources.

Wilderness

The Wrangell-St. Elias Wilderness is the largest unit of the National Wilderness Preservation System, encompassing 9,677,000 acres of remote and geographically diverse mountainous landscape. By establishing millions of acres of wilderness and stating that the park would be managed "to maintain unimpaired the scenic beauty and quality of high mountain peaks, foothills, glacial systems, lakes, and streams, valleys, and coastal landscapes in their natural state", ANILCA clearly established wilderness as a fundamental value of Wrangell-St. Elias National Park and Preserve. As such, protection of wilderness characteristics is necessary to fulfill specific purposes identified in the establishing legislation of the park.

Under the preferred alternative, negligible adverse impacts to the untrammeled 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. Total ORV use on trails in and leading to the wilderness would increase by 66 percent, all related to ORV use for subsistence purposes. The resulting increase in the level of 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 6 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.

This moderate effect on wilderness character would not result in impairment because the preferred alternative limits the expansion of trails-related impacts by limiting off-trail subsistence ORV use.

Soundscape

Soundscape is not identified as a park purpose or as a significant park resource, either in ANILCA or in the general management plan for the park.

The preferred alternative would have minor, long-term, adverse direct and indirect impacts to soundscapes because more ORV noise would be anticipated in the analysis area during the summer and fall seasons. Based on the increased number of ORV trips in the analysis area, 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 analysis area are expected to be negligible. 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 the preferred alternative 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 and would not result in impairment.

Summary

As described above, adverse impacts anticipated as a result of implementing the preferred alternative on a resource or value whose conservation is necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or identified as significant in the park's general management plan or other relevant NPS planning documents; would not rise to levels that would constitute impairment.

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APPENDIX B

Wilderness Eligibility Revision

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APPENDIX B

WILDERNESS ELIGIBILITY REVISION

Introduction

This Appendix provides detailed information on the wilderness eligibility revision that is being proposed as part of the Nabesna ORV Management Plan/EIS. The first section provides information and definitions helpful to understanding the National Park Service (NPS) wilderness process. The second section provides background information on the 1986 eligibility assessment and mapping done as part of the Wrangell-St. Elias National Park and Preserve General Management Plan (GMP). This section also includes the 1986 eligibility map. The third section explains why specific revisions are being considered and presents the data used to justify each revision.

I. NPS wilderness process and definitions

Eligible wilderness: This is a term used in NPS policy which refers to lands that have met the NPS's initial screening assessment as to whether they meet the minimum criteria for inclusion in the national wilderness preservation system (NPS Management Policy 2006, 6.2.1)

- The old term for these lands is “suitable”. It was found to be confusing because language in the Wilderness Act in Section 3(c) uses the term “suitable” to refer to lands that the Secretary of Interior is sending to the President that have been studied through a public process.
- Lands that were included in the “Wilderness Suitability Review” that is appended to the 1986 Wrangell-St. Elias National Park and Preserve GMP are those lands that are “eligible” wilderness.
- Finding lands eligible is a declarative process under NPS policy and public involvement is limited to a notification of intention to conduct the assessment and publication of the Director's determination (NPS Management Policy 2006, 6.2.1.3).
- Under policy, eligible wilderness is managed as wilderness to preserve Congressional options for action in the future.

Wilderness study: The next step in the process.

- A wilderness study takes the lands that are eligible and conducts a formal study to develop what would become the recommendation to Congress for wilderness designation.
- NPS considers this to be an action requiring NEPA, hence a public process.
- Not all eligible lands go forward as proposed wilderness (the next step) from the NPS Director to the Assistant Secretary. That is the purpose of the study and the public involvement process—to sort out which, if any, of the eligible lands the NPS proposes to be sent to Congress.
- For Wrangell-St. Elias National Park and Preserve a wilderness study was conducted as an EIS in 1988, pursuant to ANILCA Section 1317. An EIS was drafted but no final action was

taken and no Record of Decision completed. The EIS is not considered to be complete by the NPS.

Proposed wilderness: Those lands which have undergone a wilderness study and which the Director has forwarded to the Assistant Secretary's Office for action by the Secretary.

Designated wilderness: Wilderness that Congress has designated through law.

II. 1986 Wilderness Eligibility Assessment

Background: Wrangell-St. Elias National Park and Preserve was established by ANILCA, which was adopted on December 2, 1980. Section 701 of ANILCA designated "approximately eight million seven hundred thousand acres" as wilderness within Wrangell-St. Elias National Park and Preserve. This number has since been refined based on better mapping techniques and consideration of inholdings. ANILCA Section 1317 required a wilderness eligibility review and wilderness recommendations regarding the non-designated lands in the park.

To meet this requirement, the park included a wilderness eligibility review as part of its 1986 GMP. Wilderness review criteria specific to the park were developed. The specific criteria are described as follows:

Land Status

- Federal land—eligible
- Federal land under application, unpatented mining claims, and cemetery and historic sites—ineligible if conveyed or patented into nonfederal ownership; may be eligible if retained in federal ownership
- Patented land—ineligible (includes lands tentatively approved or interimly conveyed)

Mining Development

- Areas of minor past activities and disturbance and seismic line scars—eligible
- Areas of major past and current activities—ineligible

Roads and ATV Trails

- Unimproved and unused or little used roads or ATV trails—eligible
- Improved and regularly used roads or ATV trails—ineligible

Landing Strips

- Unimproved or minimally improved strips—eligible
- Improved and maintained strips—ineligible

Cabins

- Uninhabited structures; hunter, hiker, and patrol cabins—eligible
- Inhabited structures as a primary place of residence—ineligible

Size of Units

- Greater than 5,000 acres, adjacent to existing wilderness or of a manageable size—eligible
- Less than 5,000 acres or of an unmanageable size—ineligible

Historic and Archeological Sites

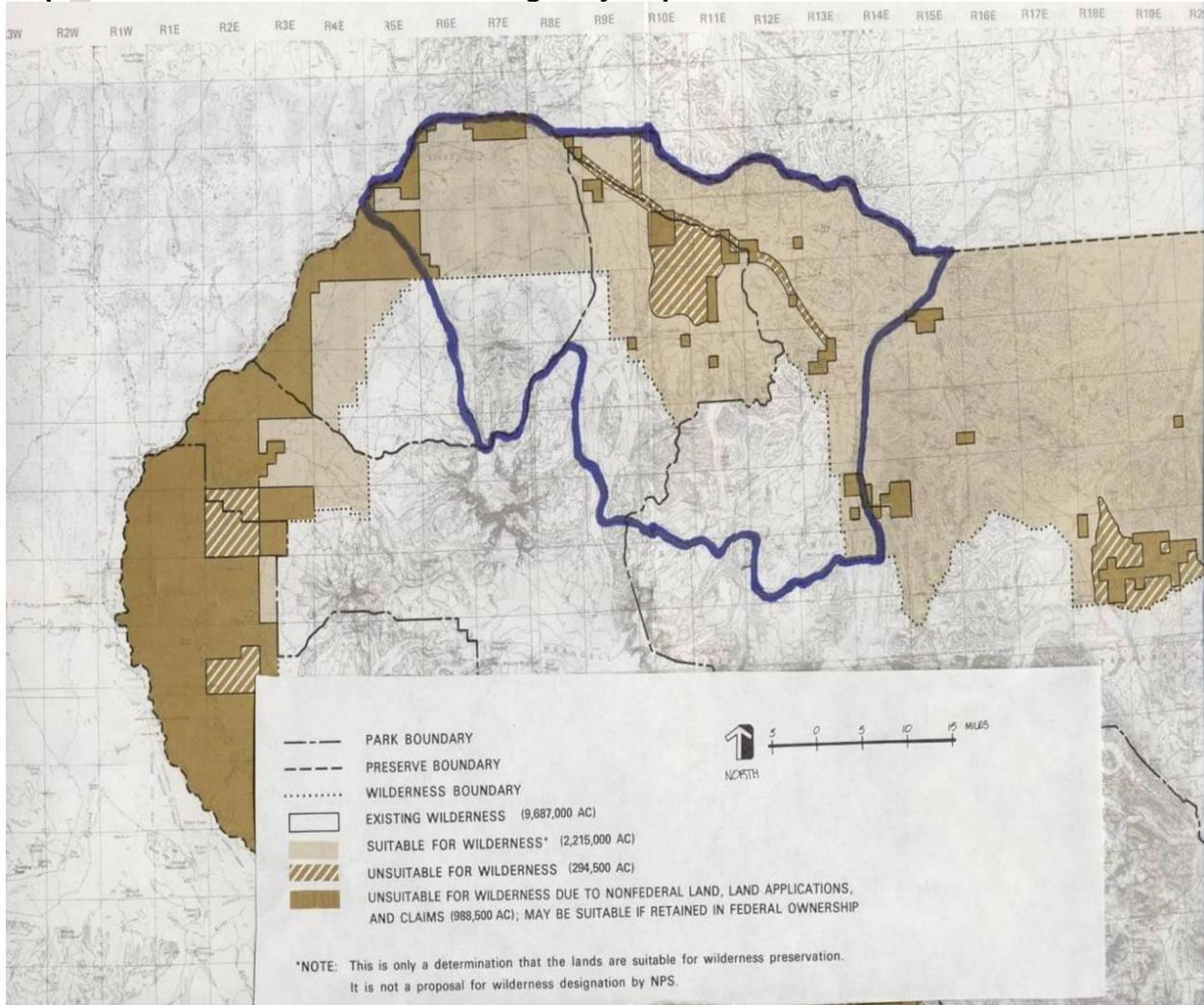
- Sites not currently used or intended for primary visitor use—eligible
- Primary visitor attractions—ineligible

Within the Nabesna ORV Management Plan/EIS analysis area, it was determined that the following federal nonwilderness lands did not meet the criteria: “6) an area between the Nabesna Road and Tanada Lake, and the Suslota Lake trail north of the Nabesna Road that allows access to BLM lands north of the preserve, are ineligible because of the impacts from regularly used access routes for subsistence, recreation, and nonfederal interests; and 7) the main road corridors (Nabesna Road).”

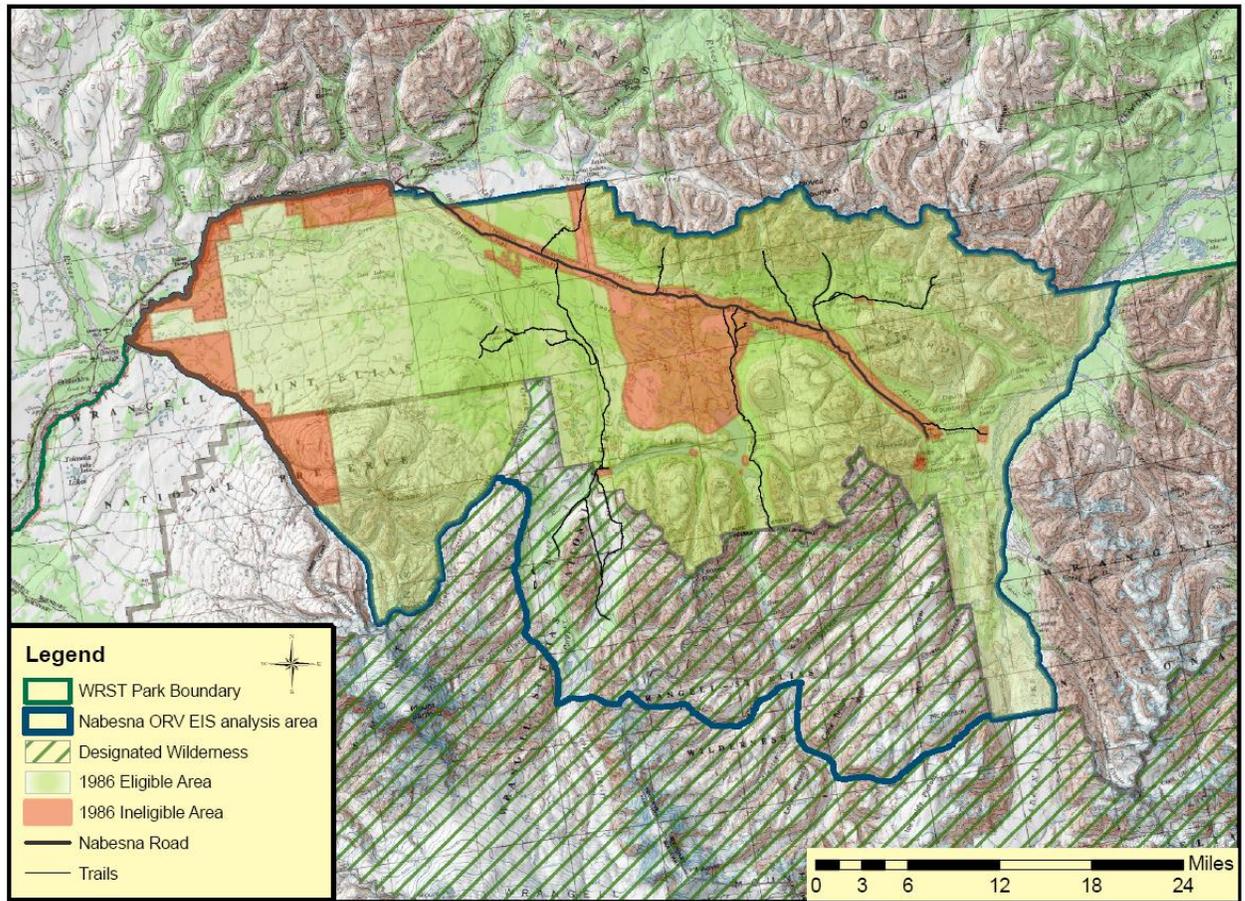
In total, approximately 2,243,800 acres of nonwilderness federal lands within the park/preserve met the criteria as established by the Wilderness Act. Within the Nabesna ORV Management Plan/EIS analysis area, there were 617,966 acres of nonwilderness federal lands that met the criteria. A wilderness eligibility map was included in the GMP, a scanned version of which is shown below (Map B-1).

Map B-2 shows the 1986 eligibility map, with trail locations and with updated land status displayed.

Map B-1. Scanned 1986 Wilderness Eligibility Map from GMP



Map B-2. 1986 Wilderness Eligibility



III. Eligibility mapping revisions

The Nabesna ORV Management Plan/EIS discloses the effects of ORVs, degradation associated with trails, and trail improvements on designated and eligible wilderness within the analysis area. To analyze the effects, we transposed the coarse level of eligibility mapping done in 1986 onto a map showing trail locations and updated land status (Map B-2). This map showed that it was appropriate to propose an eligibility mapping revision for the following reasons:

1. Areas mapped as ineligible in 1986 do not match the narrative description and criteria used in 1986. Specifically, the large area between the Tanada Lake and Copper Lake trails was determined ineligible because of “impacts from regularly used access routes for subsistence, recreation, and nonfederal interests”. Much of the area mapped as ineligible is not impacted by trail use and was not in 1986. On the other hand, the 1986 mapping completely missed the Copper Lake trail and most of the Suslota trail, areas that were impacted in 1986.
2. Some areas should have been mapped as ineligible in 1986, based on the criteria used and described under Section II of this Appendix. This would apply to trails that were “improved or regularly used” or had impacts associated with them in 1986.
3. The 1986 criteria list “federal land under application” as ineligible but may be eligible if retained in federal ownership. Some lands shown on the 1986 map as ineligible have been retained in federal ownership and meet the criteria as eligible.

In response to these concerns, the following discussion proposes mapping revisions with supporting data.

1. Areas mapped as ineligible in 1986 do not match the narrative description and criteria used in 1986.

The 1986 GMP describes impacts associated with regular ORV use on the Tanada Lake, Copper Lake, and Suslota trails as the reason to map these areas as ineligible. Clearly, trail impacts existed in the early 1980s, as shown in the following aerial (Photos B-1 and B-2) (USGS, Alaska High Altitude Aerial Photo program, 1980, 1981, and 1982). Each photo scale is approximately 1:3,000.

Average trail width for the Tanada Lake trail was measured as 12 feet in 1984, with some trail widths exceeding 600 feet. Average widths for Suslota and Copper Lake trails were 131 feet and 110 feet, respectively. As an eligibility mapping revision, the NPS proposes that a 0.5-mile buffer around these trails would include all impacts and provide a buffer against motorized impacts (noise) on adjacent eligible lands. The lands shown as ineligible in Map B-2 that lie between the Tanada and Copper Lake trails and south of the Nabesna Road corridor meet the 1986 criteria for eligibility so the map will be revised to include these lands as eligible. The results of these revisions are shown on Map B-3.

2. Some areas should have been mapped as ineligible in 1986, based on the criteria used and described in Section II of this Appendix. This includes trails that were “improved or regularly used” or had impacts associated with them in 1986.

Table B-1 displays 1986 permitted ORV use and current estimated ORV use for six trails mapped as eligible in the 1986 eligibility assessment:

Photo B-1. Tanada Lake Trail Impacts, early 1980s

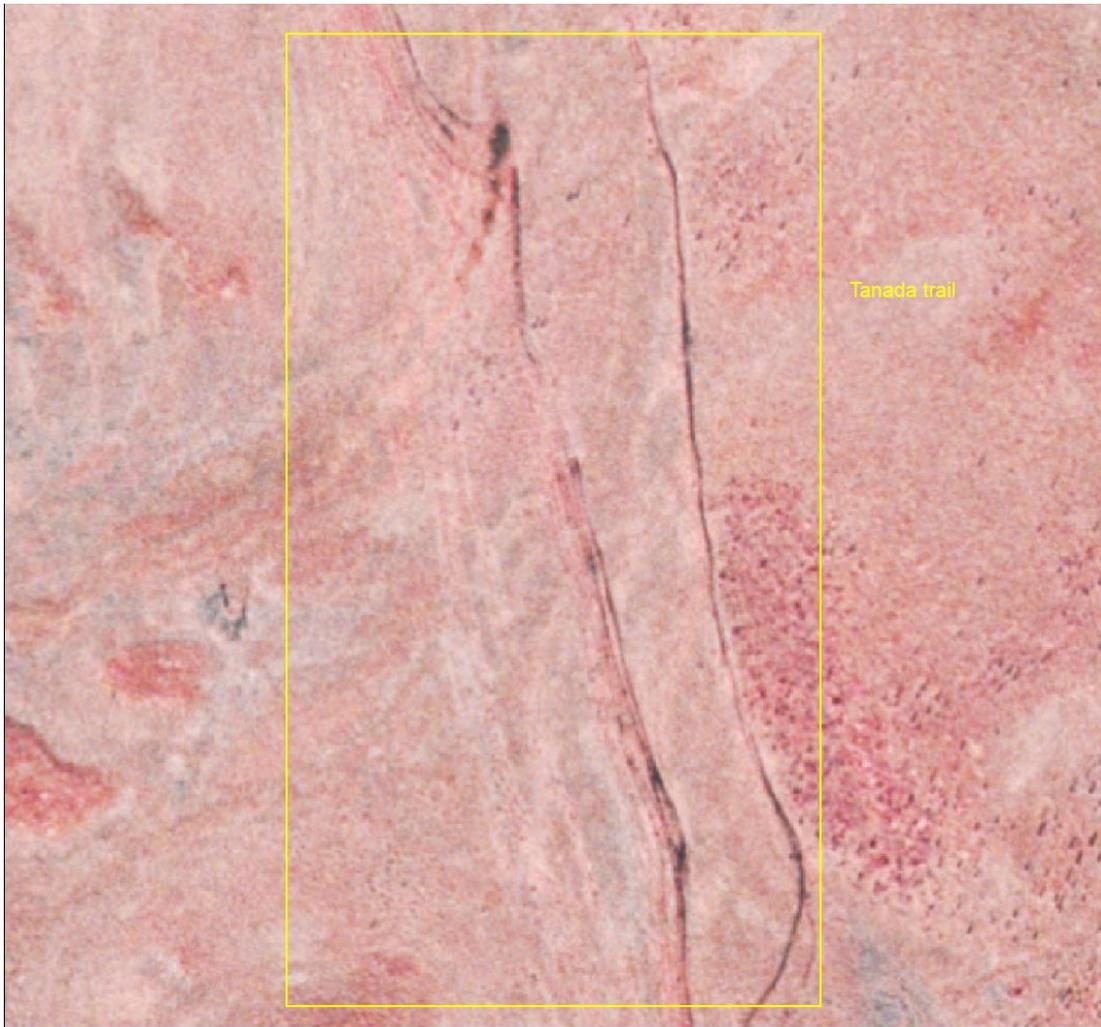


Photo B-2. Suslota Trail Impacts, early 1980s

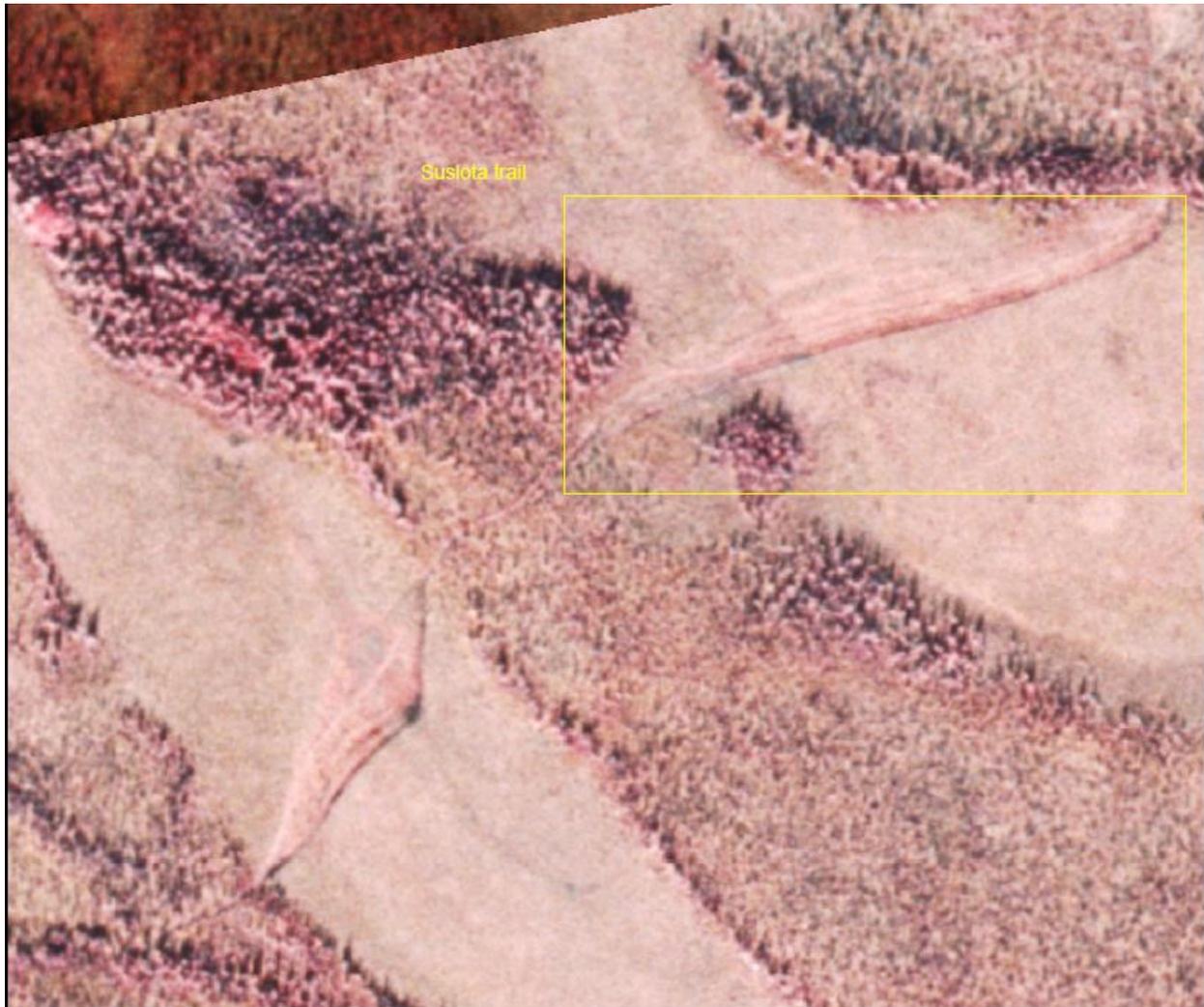


Table B-1: 1986 Trail Width and Permitted ORV Use

Trail	1986 Trail Width (feet)	1986 ORV Use (permits issued)		Current Estimate of ORV Use (round trips)	
		Recreational	Subsistence	Recreational	Subsistence
Soda Lake	10	37	19	63	25
Caribou Creek	No data	39	16	90	30
Lost Creek	21	55	24	114	40
Reeve Field	12	22	13	25	20
Trail Creek	No data	46	23	120	35
Boomerang	No data	No data	No data	5	5

These permit data show that five of the six trails received regular ORV use in 1986. “Improved and regularly used roads or ATV trails” was the 1986 criterion for ineligibility relative to trails and roads.

Photos B-3 to B-7 and the average trail widths displayed in Table B-1 demonstrate that there were impacts associated with these trails in 1986. The aerial photography is from the USGS Alaska High Altitude Aerial Photo program, 1980, 1981, and 1982.

Based on this information, five of the six trails listed above (Soda Lake, Caribou Creek, Lost Creek, Reeve Field, and Trail Creek) met the criteria for receiving “regular” ORV use in 1986 and Soda Lake, Lost Creek, and Reeve Field had documented impacts associated with them. The aerial photography of Boomerang shows early 1980s impacts including subsidence, mud/muck holes, and some evidence of trail braiding.

As an eligibility mapping revision, the NPS proposes a 0.25-mile corridor around the Soda Lake, Caribou Creek, Lost Creek, Reeve Field, Trail Creek, and Boomerang trails. Lands within the corridors would be classified as ineligible. Additionally, the corridor for Reeve Field would be expanded outside of 0.25 mile to include the old road bed associated with the historical route that accessed the Reeve airstrip on the Nabesna River.

These proposed revisions are shown on Map B-3.

Map B-3. Proposed Wilderness Eligibility Revision

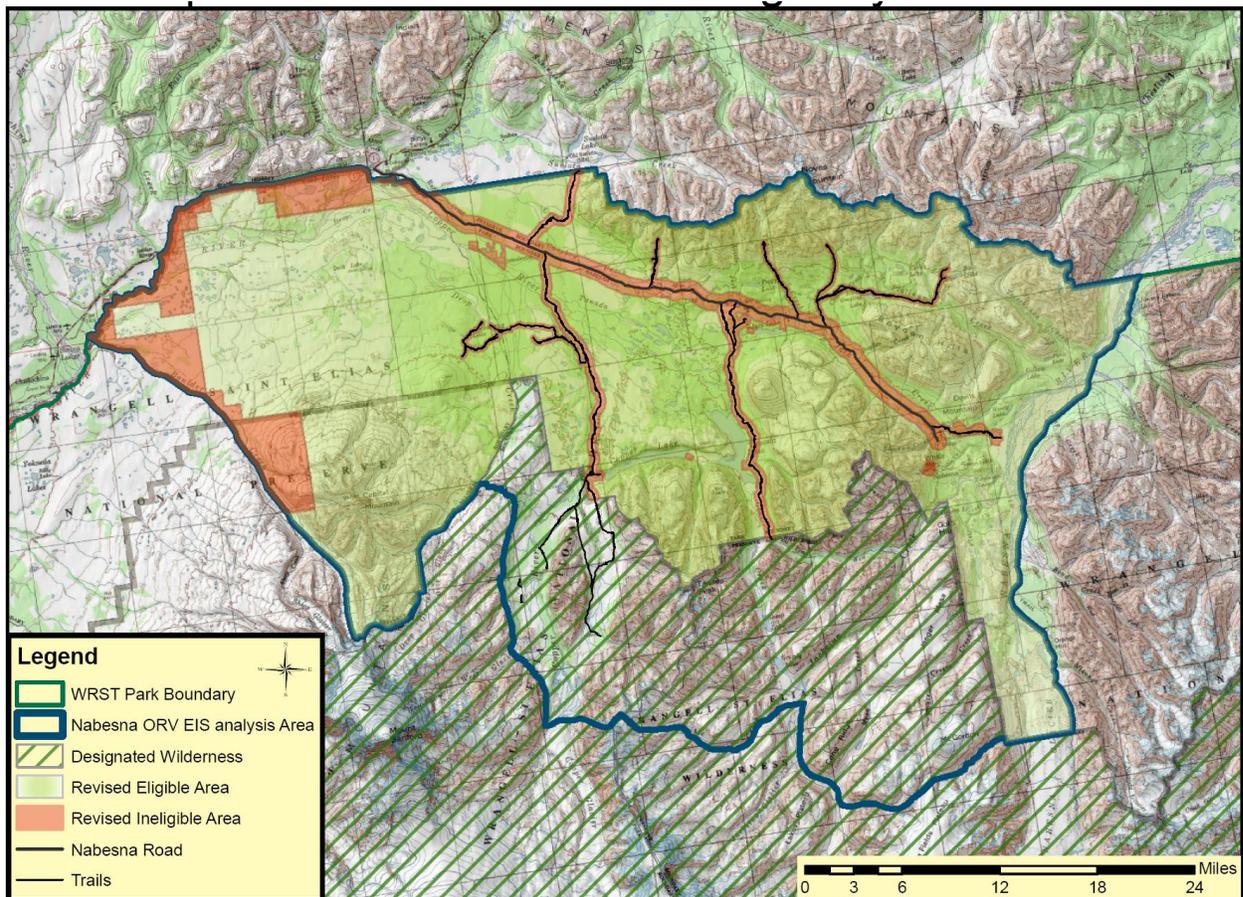


Photo B-3. Boomerang Trail Impacts, early 1980s

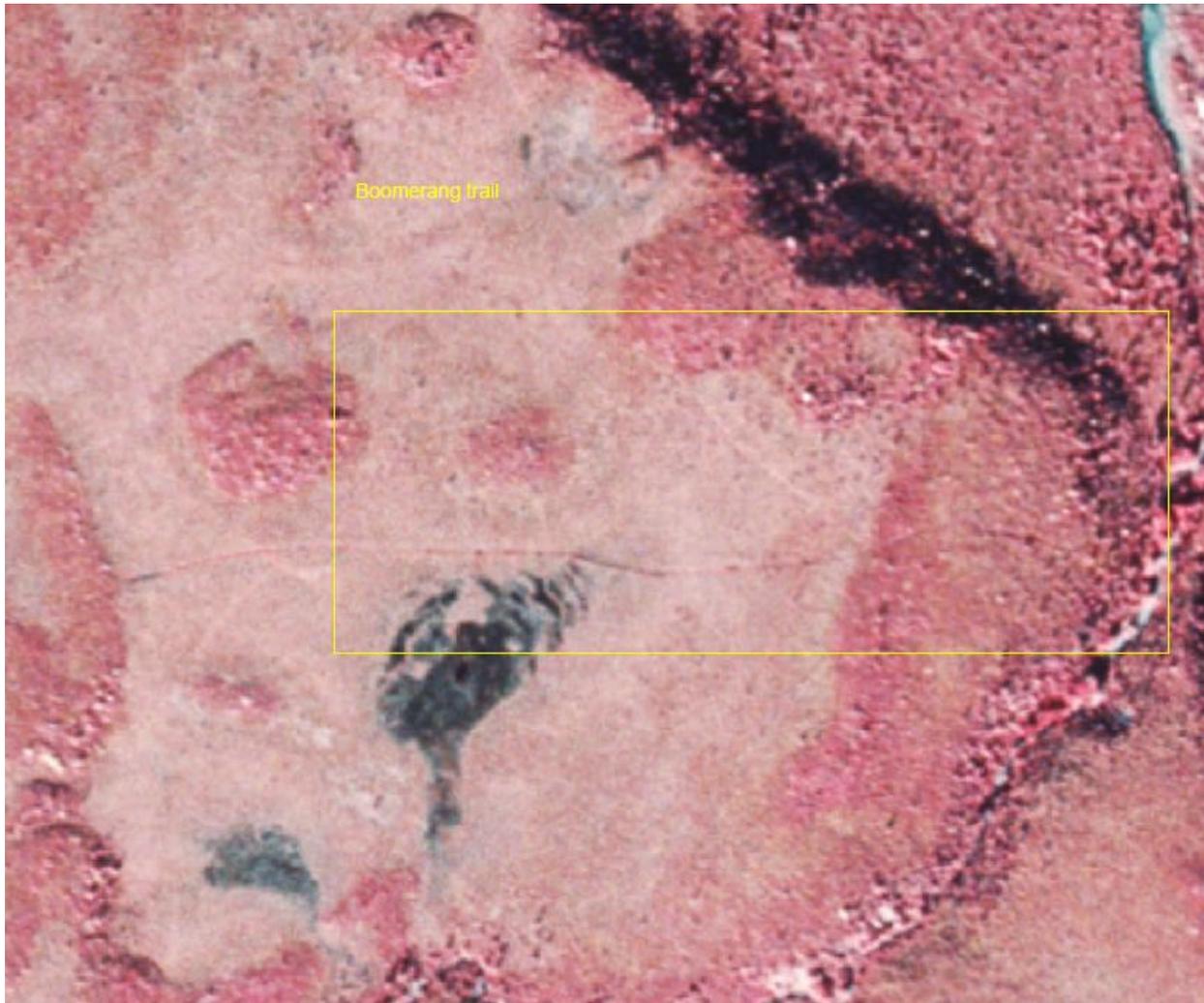


Photo B-4. Reeve Field Trail Impacts, early 1980s

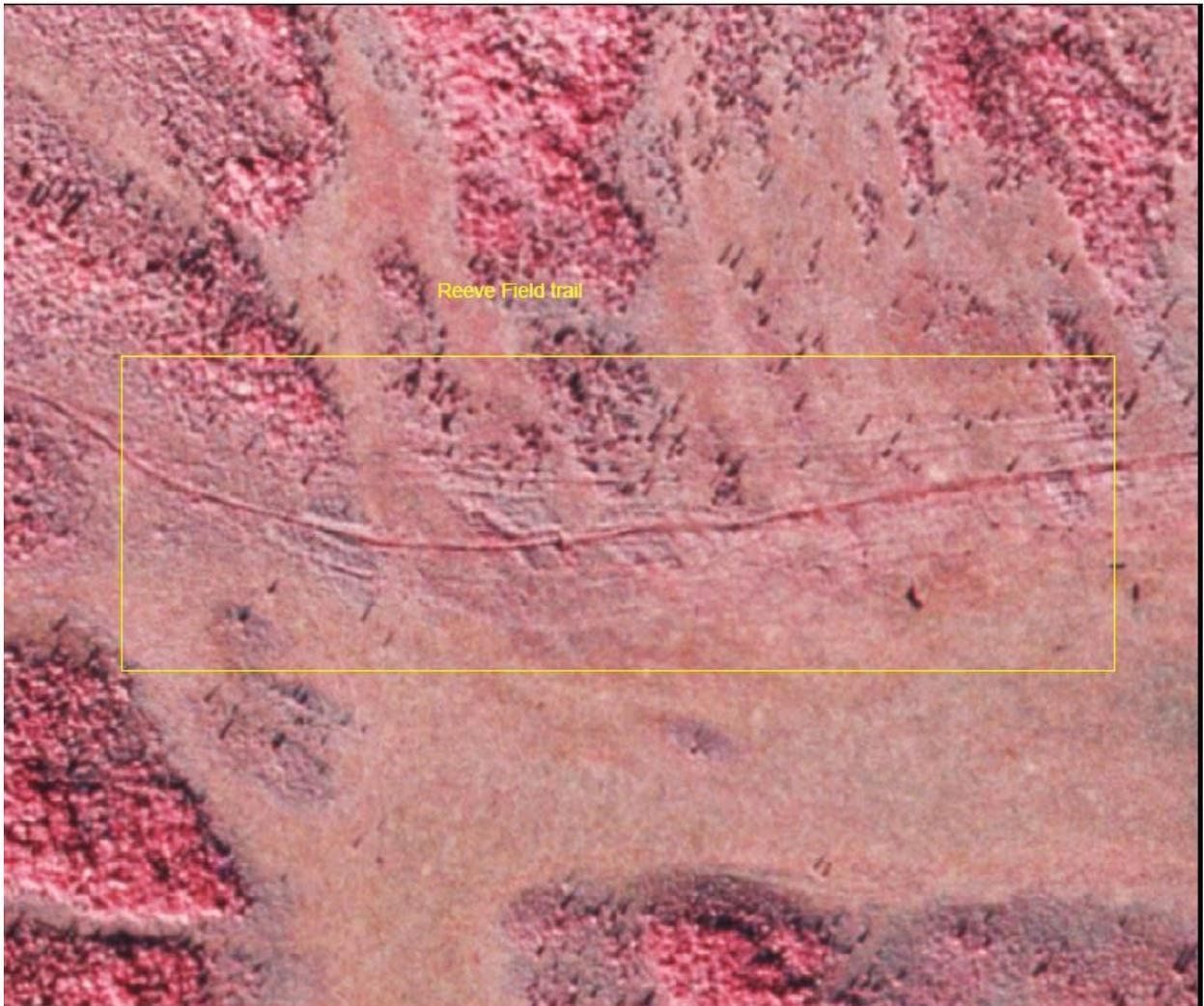


Photo B-5. Caribou Creek Trail Impacts, early 1980s

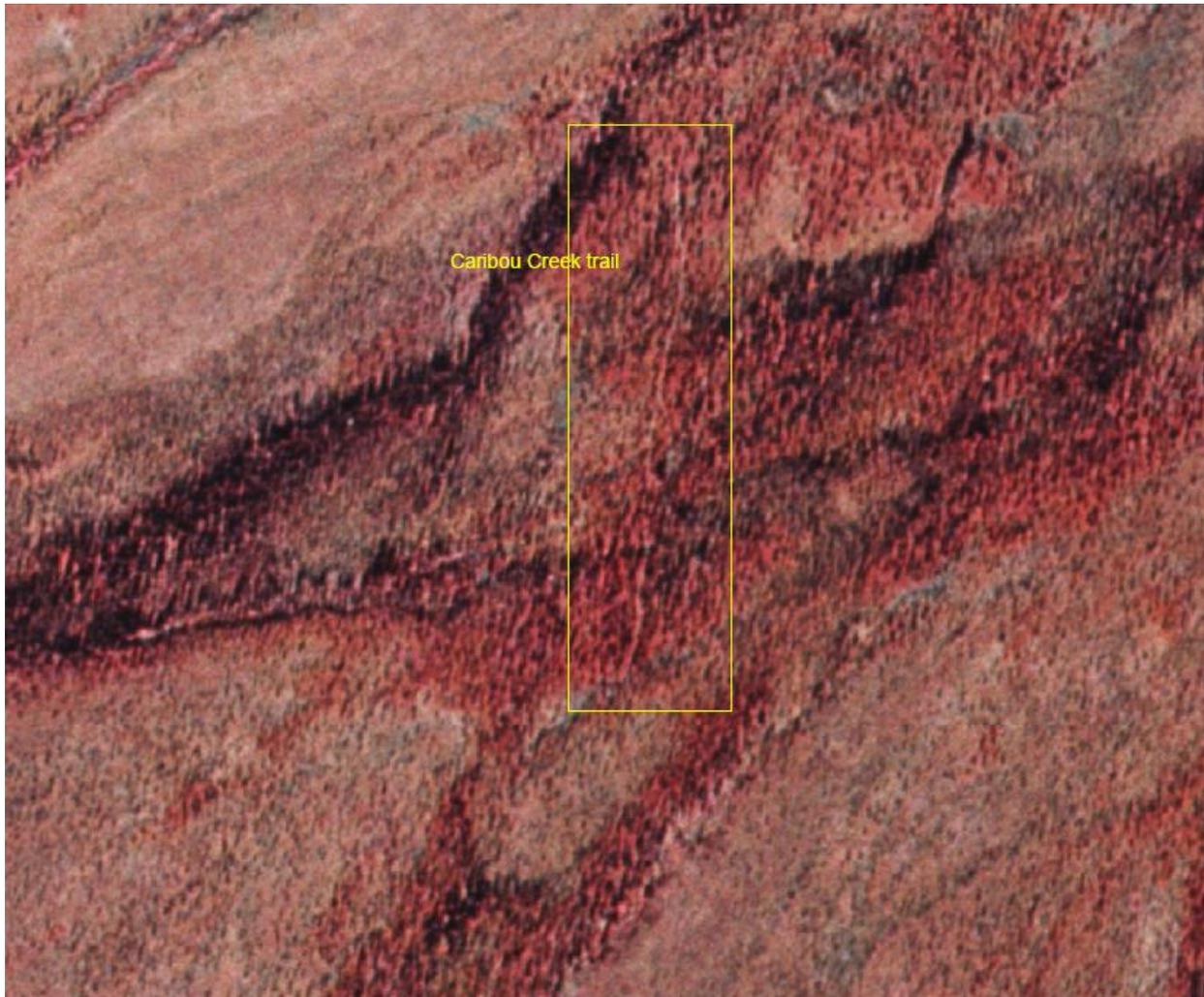


Photo B-6. Lost Creek Trail Impacts, early 1980s

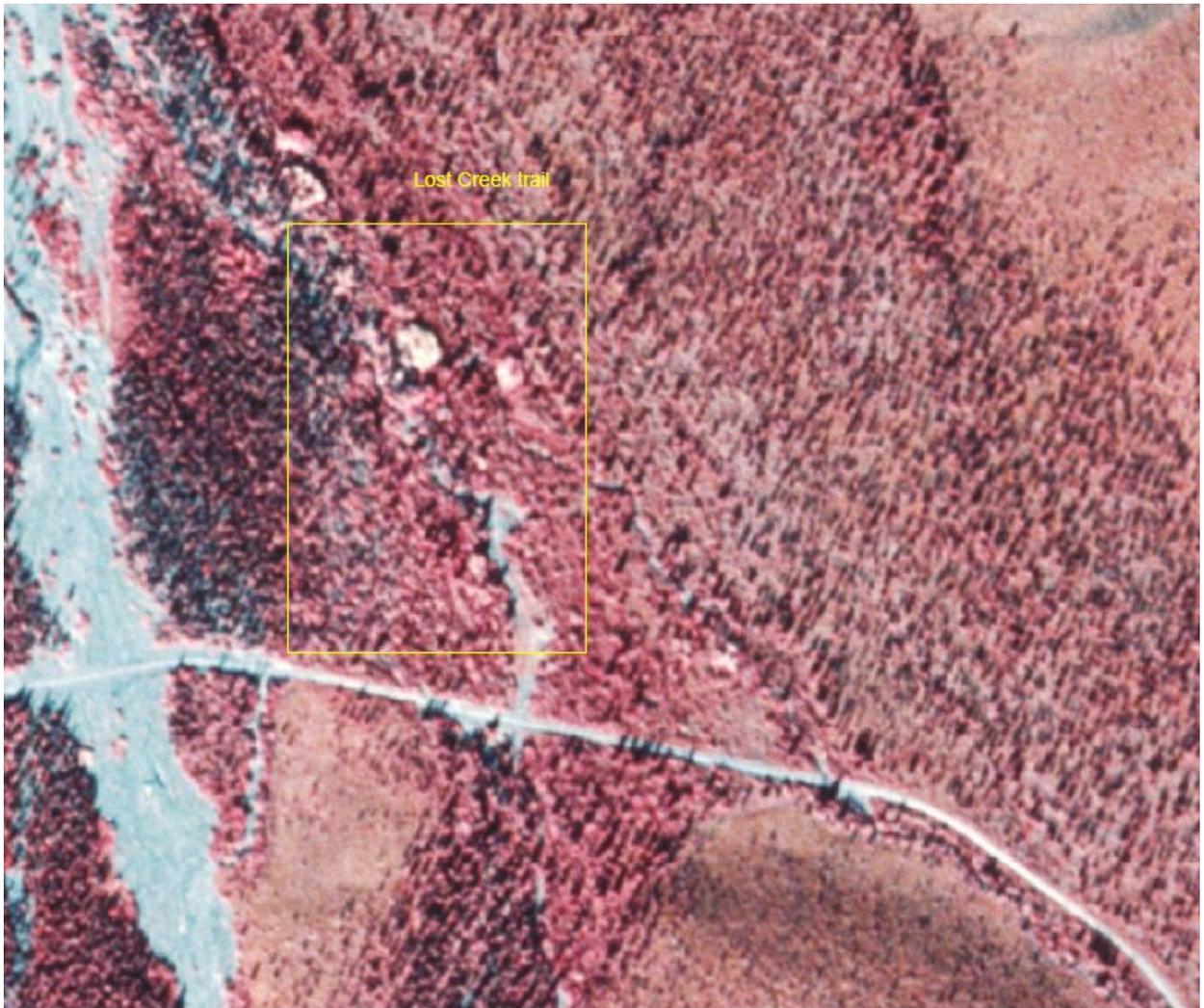
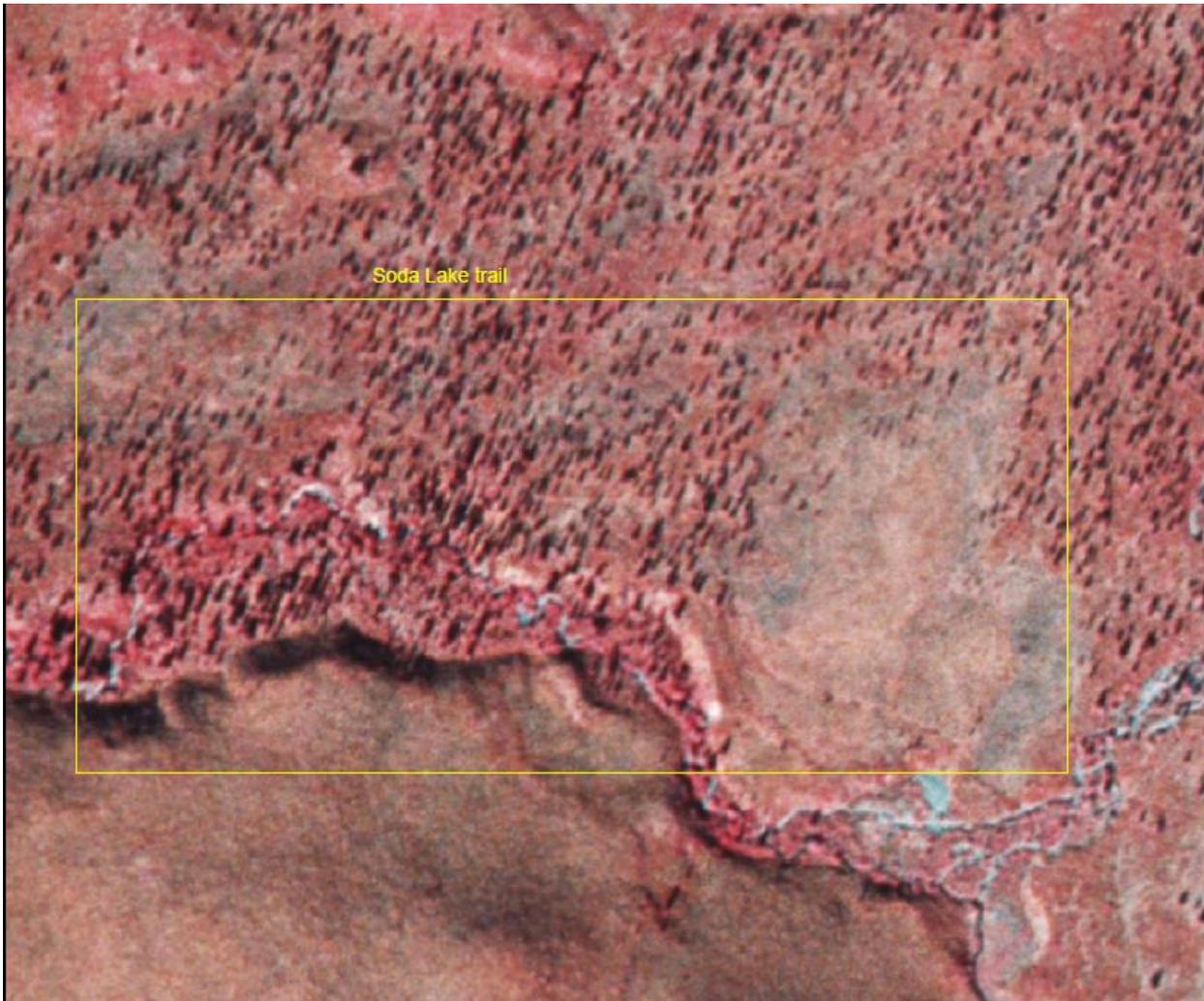


Photo B-7. Soda Lake Trail Impacts, early 1980s



3. The 1986 criteria list “federal land under application” as ineligible but may be eligible if retained in federal ownership. Some lands shown on the 1986 map as ineligible have been retained in federal ownership and may be eligible.

The map has been revised to reflect updated land status. The following 1986 criteria for land status were re-applied, based on updated land status:

Land Status

- Federal land—eligible
- Federal land under application, unpatented mining claims, and cemetery and historic sites—ineligible if conveyed or patented into nonfederal ownership; may be eligible if retained in federal ownership.
- Patented land—ineligible (includes lands tentatively approved or interimly conveyed).

The results are shown on Map B-3.

Summary

Map B-3 shows the results of all proposed changes to the 1986 eligibility assessment. Table B-2 summarizes the results:

Table B-2: Wilderness Classification Acres within Analysis Area

Wilderness Classification	1986 Eligibility Assessment	Proposed Eligibility Revision
Designated wilderness	273,440	273,440
Eligible wilderness	617,966	634,895
Ineligible	105,588	88,659

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APPENDIX C

Monitoring Strategies for Management Alternatives

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APPENDIX C

MONITORING STRATEGIES FOR MANAGEMENT ALTERNATIVES

Alternative 1 (No Action)

Monitoring Trail Condition

Trail assessment would be repeated on each of the nine trails every five years, utilizing the methodology and data dictionary used for the 2006 trail assessment. This would enable managers to determine change in trail condition classes over time.

Alternative 2 (Recreational ORV Use Permitted On All Nine Trails)

Monitoring Trail Condition

Same as Alternative 1.

Alternative 3 (No Recreational ORV Use Permitted; Minimal Trail Improvements)

Monitoring Trail Condition

Trail assessment would be repeated on each of the nine trails every 10 years, utilizing the methodology and data dictionary used for the 2006 trail assessment. This would enable managers to determine change in trail condition classes over time.

Monitoring Resource Impacts

The following monitoring indicators and standards were developed for unimproved trails and presented in Chapter 2:

Alternative 3 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%.
Wetlands	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 degraded crossings	Twenty percent or greater increase in width/depth ratio.
Fish Habitat	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 five years.

In order to measure the indicators and standards, the following method would be used:

For each of the nine trails, twenty permanent sample plots would be established. Three trails (Tanada, Suslota, and the Copper Lake trail) had plots established in 2008, based on the following methods. In order to locate and establish random plots, the trail length (based on 2006 assessment data) is divided by 20 to determine the sampling plot distance interval between sample plots. The sampling plot distance interval is halved to locate the first plot from the trailhead. Subsequent sample plots are located using the sample plot distance interval from the first or previous plot location.

At each of the sample plots, trail impact width is measured. Trail impact width is the width of all disturbances related to trail use at the plot location, past and present. It is measured by locating the outer edges of the visually detectable braids and measuring the width in meters. Within the trail impact width there may be unaffected as well as affected areas. Braiding is measured by simply counting the number of braids within the trail impact width. Soil compaction (depth of ruts) and bare ground are measured at 20 sample points located at each sample plot. To locate the 20 sample points, trail impact width is divided by 20 to determine the sampling interval. By dividing the sampling interval in half and measuring that distance from one edge of the trail impact area, the first sample point is identified. The remaining 19 sample points are located by adding the sample point distance interval to the first sample point. At each sample point, trail depth is measured (centimeters below average undisturbed ground height) and ground cover is noted (bare ground, vegetation, litter, or rock). Ponding or presence of running water is also noted, if present. Bare ground is expressed as a percent (for example, 2 points out of 20 recorded as bare ground equals 10 percent bare ground) while soil compaction is expressed as the average depth in centimeters.

Presence or absence of erosion is based on general observations, either at plot locations or traveling to plot locations. Where erosion is observed, specific points should be recorded using GPS and described on the back of the field form for the nearest sample plot.

Stream cross-sections will be taken at each of the 15 degraded trail crossings of concern identified by ADF&G in "A Survey of Recreational Off-Road Vehicle Stream Crossings Along Trails Originating from the Nabesna Road in Wrangell-ST. Elias National Park and Preserve". At each crossing location, two cross sections will be taken, one in a representative portion of the disturbed area, and one upstream of the disturbed area. Cross-sections will be established and measured using techniques described in Chapter 6 of the USDA Publication "Stream Channel Reference Sites: An Illustrated Guide to Field Technique" (Harrelson, Rawlins, Potyondy). Baseline cross-sections should be established when the 20 trail sample plots are established and should be re-read every three years.

Presence or absence of sediment deposition will be documented by measuring cobble embeddedness at crossings that have potential for supporting salmonid spawning areas (TC-1 at Tanada Creek). Cobble-embeddedness will be re-measured every three years.

Cultural resource condition assessments would be conducted every five years on recorded sites on or adjacent to (within 200 yards either side) existing trails. General observation and surface examination would be used to detect and document any disturbance. If disturbance is noted, management recommendations will be made in order to ensure future protection of the site.

Alternative 4

Monitoring Trail Condition

Same as Alternative 3.

Monitoring Impacts to Soils, Vegetation, and Wetlands

Standards, Indicators, and monitoring techniques for unimproved trails are the same as described in Alternative 3.

For improved trails, the following indicators and standards would be applied:

Alternative 4 Monitoring 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 five years.

Trail width, braiding, surface compaction, soil erosion, and mud-muck would all be noted through general observation while traveling the improved trail, based on the impact standards listed above. Observer would carry a measuring tape to assist in quantifying impacts if they are occurring. If observed, the type of impact (for example, braiding) would be noted, measured, and documented using GPS and field notes.

Monitoring for improved trails should occur at 3-year intervals.

Alternative 5

Monitoring Trail Condition

Same as Alternative 3.

Monitoring Impacts to Soils, Vegetation, and Wetlands

Standards, Indicators, and monitoring techniques for unimproved trails are the same as described in Alternative 3. Standards, indicators, and monitoring techniques for improved trails are the same as described under Alternative 4.

Monitoring Off-Trail Impacts

For subsistence ORV use off existing trails, the following standards and indicators would apply:

Alternative 5 Off-trail Indicators and Standards

Resource	Impact Indicator	Standard and Action Level
Wetlands/visuals	Braiding	Evidence of multiple parallel passes that exceed 50 feet.
Soils/visuals	Soil Compaction	Visible ruts that are greater than 3 inches deep along any 50' 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 the 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.

First, a baseline map will be produced documenting all existing trails in the analysis area. Monitoring for off-trail impacts may occur while monitoring unimproved or improved trails. If ORV use off existing trails is noted, observers will travel the “new” trail and look for the impact indicators noted above. If they are noted, measurements will be taken and location documented in field notes with GPS.

Alternative 6

Monitoring Trail Condition

Same as Alternative 3.

Monitoring Impacts to Soils, Vegetation, and Wetlands

Standards, Indicators, and monitoring techniques for unimproved trails are the same as described in Alternative 3. Standards, indicators, and monitoring techniques for improved trails are the same as described under Alternative 4.

Monitoring Off-Trail Impacts

Same as Alternative 5.

APPENDIX D
Trail Sustainability Standards
Trail Assessment Data Dictionary
Trail Cost Estimates

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APPENDIX D

TRAIL SUSTAINABILITY STANDARDS

- 1) **Design Sustainable-** a trail that meets the six Sustainable Design Guidelines (see below). These trails seldom have degradation issues because the trail is well designed for planned use types and level of use. The appropriate management oversight for design sustainable trails is to regularly (every 5 years or so) monitor trail conditions to determine appropriate cyclic maintenance actions and maintenance intervals. A basic level of annual maintenance is required to ensure the trail remains within design specifications.
- 2) **Performance Sustainable-** a trail that does not meet the six Sustainable Design Guidelines but does not display evident signs of degradation. For performance sustainable trails, degradation typically has not occurred because of low use levels or types of use that have little potential for impact. Because these trails are not inherently resistant to degradation due to poor design, any significant change in use levels, types of use, or use during unfavorable climatic or weather conditions could lead to rapid trail degradation. The appropriate management oversight for performance sustainable trails is to establish protective type, season and level of use restrictions, and conduct frequent (annual) monitoring to refine restrictions and identify any onset of degradation. Season of use restrictions may be required during periods of high site sensitivity such as spring break-up, winter freeze-up or periods of high soil moisture. A basic level of annual maintenance is required to respond to minor maintenance issues and prevent degradation.
- 3) **Maintainable-** a trail that at least partially meets all of the six Sustainable Design Guidelines but typically shows some evidence of previous degradation. Based upon a trail design and condition assessment, it is determined that a trail can be defined as maintainable if it can support a managed level of use with the addition of “reasonable” amount of site-specific mitigation and an elevated level of annual or cyclic maintenance. The appropriate management oversight for maintainable trails is to define and implement a manageable level of use (type, volume and season of use), prepare and implement mitigation and maintenance prescriptions, and conduct regular (every 3 years or so) monitoring to determine appropriate cyclic maintenance actions and maintenance intervals. A high level of annual maintenance may be required to ensure the trail remains within design specifications.
- 4) **Un-Maintainable-** a trail that does not substantially meet any of the six Sustainable Design Guidelines, displays significant degradation and cannot be “reasonably” mitigated or maintained for existing or even reduced levels and/or types of use. The appropriate management oversight for these trails is to explore options to re-route the trail, conduct major re-constructions, or close the trail and direct users to alternative trail opportunities. Closed unmaintainable trails should be stabilized against further environmental degradation and/or be rehabilitated or reclaimed depending upon site conditions and potential impacts. An extremely high level of annual maintenance may be required to prevent additional degradation prior to trail closure.

Sustainable Trail Design Guidelines

- 1) **Contour curvilinear alignment-** a trail should be properly aligned with respect to the contour of the natural landscape -it should run roughly parallel with the contour of the local terrain as it traverses or gently climbs or descends the side slopes of the landscape’s terrain features.

- 2) **Controlled grade-** based upon use characteristics and individual site conditions a trail will have a specified sustainable average and maximum trail grade. In general, most trails should have an average trail grade of less than 10% (no more than a 10 foot elevation gain or loss for every 100 linear feet); and a maximum trail grade not to exceed 15% for more than 50 feet or for greater than 5% of the total trail length. Individual site conditions such as durability of the natural soils, hydrologic conditions and displacement characteristics of use types will dictate the appropriate average and maximum sustainable grades.
- 3) **Integrated water control-** the trail design and alignment should incorporate a combination of tread outslope, natural drainage dips or intergraded grade reversals and/or constructed rolling grade dips to naturally direct water off of the trail surface in a fashion that replicates to the greatest extent possible the original landscape's surface water flow patterns.
- 4) **Full bench Construction-** trails should be constructed so that the entire width of the tread surface is built on an excavated bench of native, undisturbed material. Partial "cut and fill" bench construction is discouraged due to common tendency of filled sections to slump or fail on steep side slope sections. Filled sections are allowed when supported by properly constructed retaining walls.
- 5) **Durable tread-** trail tread surfaces should be comprised of high quality material such as compacted well-drained mineral soil, gravel, bedrock, or a type of "hardened" tread surface (e.g. imported capping material, planking, porous pavement panels, etc). An increase in tread durability maybe necessary where the rigorous application of the preceding guidelines is not possible due to site conditions, administration restrictions, potential extreme climatic or weather conditions, or demanding use requirements. This is especially important when trails cross flat-lying terrain, permafrost or wetlands.
- 6) **Regular and appropriate maintenance-** trails should receive regular maintenance to keep it within its original, or desired, design specifications. Even trails that meet all of the above guidelines require regular maintenance.

TRAIL ASSESSMENT DATA DICTIONARY

Data Dictionary Used in 2004–2006 Trail Assessment

FEATURE	ATTRIBUTE VALUE (* indicates default)	DESCRIPTION
LINE SEGMENT FEATURES		
TRAILSEG		trail segment
	GRADE	trail surface grade
	0-6%*	trail grade along segment between 0-6%, measured by clinometer.
	7-20%	trail grade along segment between 6-20%, measured by clinometer
	21-40%	trail grade along segment between 21-40, measured by clinometer
	41-60%	trail grade along segment between 41-60%, measured by clinometer
	>61%	trail grade along segment >61%, measured by clinometer
	SURFCHAR	trail surface character
	<i>Natural surfaces</i>	natural surfaces
	UPLAND VEGETATION	trail tread directly on upland plant species –typically dry sites
	WETLAND VEGETATION	trail tread directly on wetland plant species –typically wet sites
	FLOATING VEGETATION	trail tread directly on a vegetated floating bog
	NATIVE ORGANIC	trail tread eroded into organic surface layer, or peat or muck
	NATIVE FINE MINERAL*	trail tread eroded into clay or silt layer, may have >% organic mix
	MIXED FINES & GRAVEL	trail tread eroded into a mixture of gravel with fine filled voids
	SAND	trail tread eroded into fine to course sands –no or little binder
	GRAVEL	trail tread on gravel surface –typically alluvial with few fines
	COBBLE	trail tread on rounded rock surface 3-10” in diameter, few fines
	BED ROCK OR RUBBLE	trail tread on solid or packed angular rock
	WATER CROSSING	trail fords river, major stream, lake or impoundment
	<i>Altered surfaces</i>	take photos of representative sites
	IMPORTED GRAVEL	trail tread on imported (not site native) gravel mix
	WOOD CHIPS/CHUNKWOOD	trail tread on manufactured wood chips or chunkwood (large chips)
	TIMBERS/PLANKING	trail tread on dimensional lumber, e.g. boardwalks, bridge decks
	CORDUROY	trail tread on perpendicular natural poles or logs buried or on surface

TRAIL ASSESSMENT DATA DICTIONARY

Data Dictionary Used in 2004–2006 Trail Assessment

FEATURE	ATTRIBUTE VALUE (* indicates default)	DESCRIPTION
	GEOTEX SURFACE	trail tread on geotextile layer or panels
	TURNPIKE	trail tread on local material elevated filled –edged and ditched
	BRUSH/ROUGH FILLED	trail tread crosses area filled with brush, log sections or other fill
	PAVED	trail paved with asphalt, concrete or paving –front country setting
	OTHER	trail tread on some other surface not listed above
DRAINAGE		soil moisture levels of tread surface the trail segment is crossing –especially important to note if the trail hasn't eroded through the surface vegetation layers –then map as moisture level of landscape unit
	WELL DRAINED	soils are typically well drained and not subject to ponding, this is the usual case for gravel and coarse textured soils
	MODERATE WELL DRAINED	soils are moderately well drained and usually don't pond, common on compacted or low lying coarse textured soils
	POORLY DRAINED	soils are often wet, usually muddy, ponded, usually fine textured seep areas, permafrost sites, low lying sites
	SATURATED	soils are always wet with water table near surface –wetland sites
	PONDED	water on surface or evidence of ponding most of year
	WATER RUNNING	water running across/along the surface of the trail most times
	NOT INDICATED	soil moisture levels not indicated during inventory
MUDMUCK		mud-muck index –usual surface character of the trail tread –more typical on wet sites with fine soils
	NONE*	dry surface
	MUDDY	trail surface is muddy most of the time
	EXTREMELY MUDDY	trail surface has a thick surface of mud most of the time
	MUCKHOLE	single or scattered deep water and mud filled holes along trail
	MULTI MUCK HOLES	nearly continuous muck holes, still passable by OHVs
	SEASONAL IMPASSABLE	degraded conditions limit passage during wet periods
	IMPASSABLE AT ALL TIMES	degraded conditions make the trail totally unusable
	NOT INDICATED	mud-muck index not mapped during inventory
IMPACTRATE		trail impact rating –extent of surface disturbance in the form of ruts, subsistence, erosion or compaction below surrounding terrain surface –measure from terrain surface assuming compacted surface vegetation
	NONE	no impact –new trail or hard surface
	LOSS OF SURFACE VEG	traffic has largely stripped vegetation along wheel tracks
	EXPOSED ROOTS	subsurface roots and surface soils dominate tread surface

TRAIL ASSESSMENT DATA DICTIONARY

Data Dictionary Used in 2004–2006 Trail Assessment

FEATURE	ATTRIBUTE VALUE (* indicates default)	DESCRIPTION
	<2 in. RUT/SUB	trail surface is less than 2 inches below surrounding surface
	2-8 in. RUT/SUB	trail surface is 2 to 8 inches below the surrounding surface
	8-16 in. RUT/SUB	trail surface is 8 to 16 inches below the surrounding surface
	17-32 in. RUT/SUB	trail surface is 17 to 32 inches below the surrounding surface
	33-60 in. RUT/SUB	trail surface is 33 to 60 inches below the surrounding surface
	>61 in. RUT/SUB	surface is greater than 61 inches below the surrounding surface
	NOT INDICATED *	impact rate not mapped during inventory
TRACKTYPE		track type
	MAIN *	primary active route of travel
	SECONDARY-ACTIVE	actively used trail, not most active
	ABANDONED-DEGRADING	no longer in use with active erosion/degradation issues
	ABANDONED-STABILIZED	no longer in use, naturally stable i.e. no erosion/degradation
	ABANDONED-RECLAIMED	no longer in use, completely re-vegetated
	ACCESS	secondary route to main trail
	CUTOFF	alignment between two legs of main route
	SPUR	alignment for main to end point
WIDTH		track width
	1 SET WHEEL TRACKS *	single set parallel wheel tracks, vegetated center hump
	2 SET WHEEL TRACKS	2 sets of parallel wheel tracks, vegetated center hump
	STRIPPED < 6 FEET	stripped to bare ground less than 6 foot wide
	STRIPPED 6-12 FEET	stripped to bare ground 6-12 foot wide
	STRIPPED 12-18 FEET	stripped to bare ground 12-18 foot wide
	STRIPPED > 18 FEET	stripped to bare ground >18 foot wide
	MULTI-BRAID 6-20'	more than 2 sets of tracks affecting an area approx. 6-20 feet wide
	MULTI-BRAID 20-40'	more than 3 sets of tracks affecting an area approx. 20-40 feet wide
	MULTI-BRAID 40-80'	more than 4sets of tracks affecting an area approx. 40-80 feet wide
	<i>from 80' wide and up consider mapping as Braided Impact Area</i>	
	MULTI-BRAID 80-160'	more than 5 sets of tracks affecting an area of approx. 80-160 feet

TRAIL ASSESSMENT DATA DICTIONARY

Data Dictionary Used in 2004–2006 Trail Assessment

FEATURE	ATTRIBUTE VALUE (* indicates default)	DESCRIPTION
	MULTI-BRAID 160-320'	lots of tracks affecting an area approx. 160-320 feet wide
	MULTI-BRAID 320-480'	lots of tracks affecting an area approx 320-480 feet wide
	MULTI-BRAID >480'	a whole lot of tracks affecting a very large area
	NOT INDICATED	value not mapped during inventory
SIDESLOPE		side slope
	0-20%	slope of adjacent terrain between 0-20% -measured by clinometer
	21-60%	slope of adjacent terrain between 21-60% -measured by clinometer
	61-100%	slope of adjacent terrain between 61-100% -by clinometer
	>101%	slope of adjacent terrain between >101% -measured by clinometer
	NOT INDICATED*	value not mapped during inventory
STONINESS		stone hindrance -extent to which surface stones or rocks create a overly rough surface or barrier to travel
	NONE *	no problem with stones or rocks
	< 10%	a few rocks or large stones affect travel
	11-25%	11-25% of the trail surface has large enough rocks to affect travel
	26-75%	25-75% of the trail surface has large enough rocks to affect travel
	76-100%	76-100% of the trail surface has large enough rocks to affect travel
	NOT INDICATED	value not mapped during inventory
NAME		trail name
ROAD		road
	TYPE	road type
	ACCESS	road providing access to trailhead or trail along alignment
	PRIMARY HWY	major paved highway
	SECONDARY *	paved or gravel road
	SUBDIVISION	paved or gravel road through or serving a subdivision
	UN-IMPROVED	dirt track with few improvements
	OTHER	other road not included above
ROAD SURFACE		road surface

TRAIL ASSESSMENT DATA DICTIONARY

Data Dictionary Used in 2004–2006 Trail Assessment

FEATURE	ATTRIBUTE VALUE (* indicates default)	DESCRIPTION
	PAVED	asphalt, concrete or other pavement
	GRAVEL *	gravel surface
	DIRT	native soil surface
ROAD_ WD_SURFACE		road width surface
	8-12 FEET	road surface 8-12 feet wide
	13-16 FEET	road surface 13-16 feet wide
	17-20 FEET	road surface 17-20 feet wide
	21-30 FEET	road surface 21-30 feet wide or wider
	NAME	name of road –text up to 30 characters
	LINEGEN	a line feature not otherwise listed above
	TYPE	text entry up to 30 characters
POINT FEATURES		
ANCHORPT		GPS anchor point -points collected to provide accurate GPS ground reference for line feature editing
	TYPE	GPS anchor point type
	BEGINNING	point at the beginning of a linear feature
	MIDDLE *	point midway along a linear feature
	END	point at the end of a linear feature
	JUNCTION	point of two or more roads intersect
	ANGLE	point used to anchor a major turn along the alignment
	TRAIL BREAK	break in mapping along trail alignment
AQUAMGT		water management -location of a constructed trail feature
	TYPE	water management type
	WATER BAR	location of a constructed water bar
	GRADE DIP	location of a constructed grade dip
	ROLLING DIP	location of a constructed rolling dip

TRAIL ASSESSMENT DATA DICTIONARY

Data Dictionary Used in 2004–2006 Trail Assessment

FEATURE	ATTRIBUTE VALUE (* indicates default)	DESCRIPTION
	NATURAL DIP	naturally occurring drain dip
	CULVERT –ROUND	round culvert in place for cross drainage –indicate size below
	CULVERT –OTHER	box, “U” or other type culvert
	OPEN TOP X DRAIN	open cross drain –timber, rock or other
	CHECK DAM	constructed structure to slow water flow
	DITCH A’	starting point of a dug ditch for water management
	DITCH B’	angle or end point of a dug ditch for water management
	CURTAIN DRAIN A’	starting point of a curtain drain for water management
	CURTAIN DRAIN B’	angle or end point of a curtain drain for water management
	OTHER	other water management feature not otherwise listed
CONDITION		condition as pertains to maintenance attention of feature
	SERVICABLE *	feature does not require maintenance
	POOR	feature requires maintenance for full performance
	OUT OF SERVICE	feature is no longer providing designed function
CULVERT SIZE		round culvert diameter in inches
AQUAPROB		water related trail problem
	TYPE	water problem type
	STRUCTURE FAILURE	constructed trail water feature that has failed
	BLOCKED DRAIN	plugged or blocked drainage feature, or down slope drain
	WASH OUT	section of trail washed away by water
	HEAD CUT	site of active head cut erosion
	EROSION ZONE	site of major active erosion along trail alignment
	DAM	site of unplanned dam or blockage
	PONDED AREA	site of ponded area affecting trail utility (may want to area map)
	SPRING SOURCE	site of natural spring
	SEEP ZONE A’	beginning or single point of water seep area affecting trail
	SEEP ZONE B’	mid or end point of water seep area affecting trail

TRAIL ASSESSMENT DATA DICTIONARY

Data Dictionary Used in 2004–2006 Trail Assessment

FEATURE	ATTRIBUTE VALUE (* indicates default)	DESCRIPTION
	EROSION CHANNEL A'	beginning point of active erosion channel
	EROSION CHANNEL B'	angle or end point of active erosion channel
	DEPOSITION ZONE	area where eroded material has been deposited (possibly area map)
	SED. DISCHARGE POINT	point where eroded material enters a water course
	OTHER	other water related problem not listed above
STREAMX		significant stream or river crossing, not a simple drainage feature, seep or cross drain
	CROSSING TYPE	crossing type
	UNIMPROVED FORD	simple unimproved crossing
	IMPROVED FORD *	some to major structural improvements
	BRIDGE	bridge deck
	CULVERT	culvert or culverts of any type
	OTHER	other crossing type
	STREAM NAME	stream name -text entry, 30 character max
	STREAM WIDTH FT	stream width in feet from top of bank to bank –numeric 1-999
	APPROX. CFS	approximate stream flow in cubic feet per second at time of site inspection
	BRIDGE WIDTH	bridge deck width in feet
PHYREFPT		physical reference point -single point or line crossing trail feature that is a distinct reference point along the trail alignment
	TYPE	physical reference point type
	MILEPOST *	permanent marker or temporary mileage point
	TRAILHEAD	beginning point for trail (also map associated features)
	TRAIL MARKER	reassurance marker, flagging, tripod, reflector, post etc
	SURVEY MARKER	survey located point (also see survey control point feature)
	PROPERTY MARKER	sign, post, cleared line, etc. denoting property line crossing
	ROAD JUNCTION/XING	junction point with a road, or crossing point with a road
	GATE OR BARRIER	gate or constructed barrier designed to direct or control access
	CORRIDOR BOUNDARY	boundary of a designated area –wilderness area, W&S river

TRAIL ASSESSMENT DATA DICTIONARY

Data Dictionary Used in 2004–2006 Trail Assessment

FEATURE	ATTRIBUTE VALUE (* indicates default)	DESCRIPTION
	TRAIL COUNTER	location of trail counter for measuring trail use
	POWERLINE CROSSING	point where a power or other utility line crosses the trail
	FENCE CROSSING	point where a fence crosses the trail (associated gate?)
	OTHER	other physical reference point not listed above
	MILEPOST	milepost value in miles –numeric 0.5-999
	NAMEVALUE	associated name or value of the feature text -30 character
INTEREST		point of interest -two dimensional area of interest associated with the trail (may also want to map as genetic area feature)
	TYPE	point of interest type
	PULLOUT	good resting area adjacent to the trail alignment
	VIEWPOINT	good scenic or overlook site
	SHELTER	location of natural or manmade shelter
	CAMPSITE	active or potential campsite location
	CABIN	location of cabin, or cabin ruins
	STRUCTURE	location of structure other than a cabin
	STAGING AREA	active or potential staging area for trails work
	HELI SPOT	active or potential helicopter landing/operations site
	GRAVEL SOURCE	active or potential source for gravel
	TIMBER SOURCE	active or potential source for timber for bridges, corduroy, chips
	CULTURAL RESOURCE	location of cultural or historic resource
	SITE –HUMAN ACTIVITY	generic site of some human activity warranting documentation
	NEST SITE	raptor or T&E nest site
	T & E PLANT SITE	known or suspected location of threatened or endangered plant
	OTHER 1	other point of interest not listed above
	OTHER 2	another point needing to be differentiated from #1
SURVEYPT		survey control point -engineering survey or elevation station
	TYPE	survey point type

TRAIL ASSESSMENT DATA DICTIONARY

Data Dictionary Used in 2004–2006 Trail Assessment

FEATURE	ATTRIBUTE VALUE (* indicates default)	DESCRIPTION
	SECTION	survey monument location for a section or township marker
	PROPERTY	survey monument or marker for a property boundary survey
	ELEVATION	elevation monument, bridge w/elevation or established elevation station
	BENCH MARK	benchmark survey monument
	COMMENT	30 character text of monument –document surveyed elevations here
	ELEVATION	numeric reading
	ELEVATION SOURCE	source of elevation information
	TOPO MAP	topographic map
	GPS	GPS
	ALTIMETER	altimeter
	OTHER	other source
PHOTOPT		photo point
	FRAME NUMBER	frame/reference number -text max 10 characters
	BEARING_DEGREE_TRUE	bearing degree-true -compass direction of photo in degrees 1-360 true north
	COMMENT	comment -text 30 character
HAZARD		physical hazards along trail corridor effecting user safety
	TYPE	hazard type
	STANDING TREE	tree that may fall across trail unexpectedly or presents an aerial hazard
	FALLEN TREE	tree that blocks, or partial blocks the trail
	BRUSH/BRANCHES/VEG	any woody debris that poses a hazard
	STEEP SIDE DROP OFF	steep slope adjacent to the trail that poses a hazard
	STEEP GRADE	steep grade section that poses a roll or tip over hazard
	MAJOR WASHOUT	washed out section of the trail that creates a hazardous condition
	ABRUPT TRAIL END	trail ends abruptly and there is a risk to the user or a collision
	EXTR. CROSS SLOPE	trail surface has a high cross slope that could make OHVs unstable
	EXTR. ROUGH SURFACE	trail surface is extremely rough and poses a hazard to users

TRAIL ASSESSMENT DATA DICTIONARY

Data Dictionary Used in 2004–2006 Trail Assessment

FEATURE	ATTRIBUTE VALUE (* indicates default)	DESCRIPTION
	SLICK SURFACE	trail surface is slick under wet conditions that poses a hazard
	ROCKS ON TRAIL	rocks on trail that pose a hazard to users
	LANDSLIDE/DEBRIS FLOW	trail is subject to, or has landslides or debris flows within alignment
	STILL WATER HAZARD	ponded area along trail poses a risk to users
	RUNNING WATER HAZARD	deep or swift moving stream or river crossing poses a hazard to users
	BOGHOLE/DEPRESSION	deep hole or depression poses a hazard to users
	PINCH POINT	narrowing of the trail poses a hazard to users
	BLIND CORNER	a corner with reduced visibility poses a hazard to users
	BLIND INTERSECTION	an intersection with reduced visibility poses a hazard to users
	WILDLIFE HAZARD	some form of wildlife poses a hazard –bear den, wasp nest, moose kill
	VEGETATION HAZARD	some form of vegetation poses a hazard –poisonous plants, thorns, etc
	OTHER 1	some hazard not identified above
	OTHER 2	another hazard to be differentiated from 1
SIGNS		erected signs on or along trail alignment
	TYPE	sign type
	DIRECTIONA	a sign providing directions for trail users
	REGULATORY	a sign informing users of use regulations
	INFORMATIONAL	a sign providing general or specific information
	WARNING	a sign informing the public of a hazard
	COMMENT	comment -30 character text of sign lettering
PTGEN		point generic
	NAME/TYPE	30 character text for labeling generic point
AREA FEATURES		
BRAIDS		area impacted by OHV traffic –mapped along the outermost used alignments –typically used only for major braided areas

TRAIL ASSESSMENT DATA DICTIONARY

Data Dictionary Used in 2004–2006 Trail Assessment

FEATURE	ATTRIBUTE VALUE (* indicates default)	DESCRIPTION	
PARKING	SURFACE	highway vehicle parking area associated with trailhead	
		parking area surface	
		asphalt, concrete or other pavement	
	CONDITION	GRAVEL	gravel surface
		COMPACTED DIRT	compacted native soil surface
		VEGETATION	vegetation surface
		OTHER	other parking area surface
		SERVICABLE	serviceable condition
		NEEDS GRADING/LEVEL	parking area needs grading or leveling
SOILTER	NEEDS TOP CAPPING	parking area needs top capping	
	COMMENT	soil/terrain unit comment -text field 30 character	
AREAGEN		generic area	
	TYPE	30 character label for generic area	

TRAIL COST ESTIMATES

Table D-1. Estimated Trail Costs by Alternative (motorized trails)

Motorized Trail	Description	Length	Alternative Action					6
			1	2	3	4	5	
Suslota	Existing motorized trail	7.4	None	None	None	None	Two crossing improvements and hardening of degraded meadows. \$107,214	Improve entire trail utilizing GeoBlock and gravel hardening. \$780,000
Caribou Creek	Existing motorized trail	3.4	None	None	None	Re-construct (\$189,023)	Re-construct (\$189,023)	Re-construct. \$189,023
Trail Creek	Existing motorized trail	6.0	None	None	None	Locate/clear trail to minimize creek crossings (\$42,700)	Locate/clear trail to minimize creek crossing (\$42,700).	Locate/clear trail to minimize creek crossing (\$42,700).
Lost Creek	Existing motorized trail	5.9	None	None	None	Locate/clear trail 4 miles to minimize creek crossings (\$35,000).	Locate/clear trail 4 miles to minimize creek crossings (\$35,000).	Locate/clear trail 4 miles to minimize creek crossings (\$35,000).
Soda Creek	Existing motorized trail	12.8	None	None	Construct Soda Lake re-route \$303,697	Construct Soda Lake re-route (\$303,697)	Construct Soda Lake re-route (\$303,697)	Construct Soda Lake re-route (\$303,697)
Reeve's Field	Existing motorized trail	5.2	None	None	None	Construct re-route, install two Jack Creek bridges, close old trail. (\$120,559).	Construct re-route, install two Jack Creek bridges close old trail. (\$120,559).	Construct re-route, install two Jack Creek bridges close old trail. (\$120,559).
Tanada Lake	Existing motorized trail	18.2	None	None	None	Construct Tanada Lake re-route, close old trail. \$1,038,617	Re-Construct Tanada Lake trail, close portions of old trail. \$1,346,112	Construct Tanada Lake re-route, close old trail. \$1,038,617
Tanada Lake south trail system	All wilderness trails, includes Pass Creek and Goat Creek trails	13	none	none	none	Hand crew work similar to Black mtn.	Hand crew work similar to Black mountain. Share cost	Hand crew work similar to Black mountain. Share cost
Copper Lake (non wilderness)	Existing motorized trail	17.1	None	None	None	Copper Lake reconstruction and re-route, bridge at Tanada Creek; close old trail. \$1,132,365.	Copper Lake reconstruction and re-route, bridge at Tanada Creek; close old trail. \$1,132,365.	Copper Lake reconstruction and re-route, bridge at Tanada Creek; close old trail. \$1,132,365.

Table D-1. Estimated Trail Costs by Alternative (motorized trails)

Motorized Trail	Description	Length	Alternative Action					
			1	2	3	4	5	6
Black Mountain trail system (wilderness)	Existing motorized trail (only open for subsistence ORV use)	24.4	None	None	None	Hand crew work consisting of minor re-route marking or construction and water control. Estimate cost at \$150,000.	Hand crew work consisting of minor re-route marking or construction of water control, spot hardening. \$150,000	Hand crew work consisting of minor re-route marking or construction of water control, spot hardening. \$150,000
Boomerang	Existing motorized trail	10.2	None	None	None	Harden ramp out of Copper River. \$18,066.	Harden ramp out of Copper River. \$18,066.	Harden ramp out of Copper River. \$18,066.
Total (motorized)					\$303,697	\$3,030,027	\$3,444,736	\$3,810,027

Table D-2. Estimated Cost by Alternative (non-motorized trails)

Non-Motorized Trail or route	Description	Length	Alternative Action					
			1	2	3	4	5	6
4-mile	Constructed non-motorized trail to Copper River	1.1	No	No	No	Yes, \$18,500	Yes, \$18,500	Yes, 18,500
Mentasta traverse								
Segment 1	Constructed trail from Caribou Creek trail to Rock Creek	6.2	No	No	Yes, \$92,108	Yes, \$92,108	Yes, \$92,108	Yes, \$92,108
Segment 2	Constructed trail from Rock Creek to Trail Creek	5.0	No	No	No	No	Yes, \$74,310	Yes, \$74,310
Segment 3	Constructed trail from Trail Creek to Lost Creek	5.2	No	No	No	No	Yes, \$77,382	Yes, \$77,382
Segment 4	Constructed trail from Lost Creek to Upper Platinum	4.6	No	No	No	No	Yes, \$68,365	Yes, \$68,365
Segment 5	Upper Platinum to Soda Lake	7.8	No	No	No	No	Yes, \$115,924	Yes, \$115,924
Platinum/Soda route	Route from Upper Platinum to Soda Lake	7.4	No	No	Yes, \$4,107	Yes, \$4,107	Yes, \$4,107	Yes, \$4,107
Platinum/Reeve route	Route from lower Platinum to Reeve Field trail	7.1	No	No	Yes, \$6,741	Yes, \$6,741	Yes, \$6,741	Yes, \$6,741
Wait/Nabesna route	Route from end of Tanada trail to Nabesna	16	No	No	No	Yes, \$20,880	Yes, \$20,880	Yes, \$20,880
Sugarloaf route	Route from Skookum trail over Sugarloaf to Tanada Lake	11.7	No	No	Yes, \$8,494	Yes, \$8,494	Yes, \$8,494	No
Tanada spur	Constructed (motorized) trail from Tanada re-route to Tanada lake	2.9	no	No	No	Yes, \$19,900	Yes, \$19,900	Yes, \$19,900
Rock Creek trail	Constructed trail from Nabesna road up Rock Creek to segment 1 of Mentasta traverse.	1.8	no	no	Yes, \$28,238	Yes, \$28,238	Yes, \$28,238	Yes, \$28,238
Total (non-motorized)					\$139,688	\$198,986	\$534,949	\$526,455
Total (all trails)					\$443,385	\$3,229,013	\$3,979,685	\$4,336,482

APPENDIX E
**AKNHP Listed Rare Plants Documented to Occur within
Wrangell–St. Elias and Potentially Present within the Analysis Area**

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Appendix E. AKNHP Listed Rare Plants Documented to Occur Within Wrangell-St. Elias and Potentially Present within the Analysis Area¹

Scientific Name	Common Name	Family	AKNHP Rank ²	Number of Known Occurrences in the Park	Habitat	Region of the Park and Preserve where Species has been Observed
<i>Agoseris aurantiaca</i>	mountain dandelion	Asteraceae	G5 S1	3	Alpine meadows	Maritime St. Elias Mountains
<i>Agoseris glauca</i>	pale agoseris	Asteraceae	G5 S1	2	Alpine meadows	Chugach Mountains
<i>Arnica diversifolia</i>	snow leopardbane	Asteraceae	G5 S1	1	Moist open woodland	Upper Chitina River or Upper Chistochina River
<i>Arnica mollis</i>	hairy arnica	Asteraceae	G5 S1	1	Alpine meadows	Southern Wrangell Mountains
<i>Artemisia dracuncululus</i>	dragon wormwood	Asteraceae	G5 S1S2	1	Open dry slopes	Nutzotin Mountains
<i>Erigeron grandiflorus</i> spp. <i>arcticus</i>	N/A	Asteraceae	G4T3T4 S3	14	Alpine herbaceous slopes	Mentasta Mountains
<i>Taraxacum cameocoloratum</i>	dandelion	Asteraceae	G3Q S3	10	Alpine slopes and coarse, well-drained substrates	Nutzotin, Mentasta, Wrangell, and St-Elias mountains
<i>Cryptantha shackletteana</i>	Shacklett's catseye	Boraginaceae	G1Q S1	2	Dry gravels on open, calcareous slopes	Mentasta Mountains
<i>Aphragmus eschscholtzianus</i>	Aleutian cress	Brassicaceae	G3 S3	33	Solifluction soil	Park-wide in the mountains
<i>Arabis calderi</i>	Calder's rock-cress	Brassicaceae	G3 S1	2	Grassy clearings, meadows, and openings in thickets in sub-alpine and alpine areas	St. Elias Mountains
<i>Arabis codyi</i>	Cody's rock-cress	Brassicaceae	G1G2 S1	1	Unstable alpine slopes	Granite Range, Chugach Mountains
<i>Arabis drepanoloba</i>	Rockcress	Brassicaceae	G5T4 S1	1	Talus, rock fields, ridge crests, and outwash gravels in the high mountains	Chugach Mountains
<i>Arabis lemmonii</i>	Lemmon's rock-cress	Brassicaceae	G5 S1	1	Rocky ridges, rock fields, outwash gravels in the high mountains	Granite Range, Chugach Mountains
<i>Draba densifolia</i>	denseleaf; Whitlow-grass	Brassicaceae	G5 S1	1	Scree slopes, stony exposed ridges, talus, disintegrating rhyolite, granitic sand, and gravel, chip-rock, shaded rock crevices, and rocky knolls	Nutzotin Mountains
<i>Draba incerta</i>	Yellowstone; Whitlow-grass	Brassicaceae	G5 S2S3	12	Calcareous screes	Granite Range, South Wrangell Mountains

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Scientific Name	Common Name	Family	AKNHP Rank ²	Number of Known Occurrences in the Park	Habitat	Region of the Park and Preserve where Species has been Observed
<i>Draba kananaskis</i>	longstalk; Whitlow-grass	Brassicaceae	G1Q S1	2	Alpine communities, rocky alpine slopes, rocky ledges, bare shale, and limestone slopes with large blocky talus	Granite Range, Chugach Mountains
<i>Draba lonchocarpa</i> var. <i>thompsonii</i>	lance-Pod; Whitlow-grass	Brassicaceae	G4T3T4 S1	1	Alpine ledges and rocky slopes	Mentasta Mountains
<i>Draba porsildii</i>	Posild's Whitlow-grass	Brassicaceae	G3G4 S1S2	9	Alpine scree, gravel, open shale slopes, and meadows	Mentasta, Nutzotin and St. Elias mountains and Granite Range
<i>Draba praealta</i>	tall Whitlow-grass	Brassicaceae	G5 S1S3	1	Alpine shale cliffs, moist banks and slopes, rocky embankments, steep hillsides, limestone talus, damp rocks, and sub-alpine slopes	St. Elias Mountains
<i>Draba ruaxes</i>	Rainier; Whitlow-grass	Brassicaceae	G3 S3	24	Crevices of disintegrating andesite, windy ridges, summits, scree slopes, and cliffs	Wrangell-St. Elias, Mentasta, and Nutzotin mountains
<i>Smelowskia calycina</i> var. <i>porsildii</i>	Porsild's false candytuft	Brassicaceae	G5T2T3Q S2S3	5	Alluvial fans, gravel and talus alpine slopes	Nutzotin Mountains
<i>Thlaspi arcticum</i>	Arctic pennycress	Brassicaceae	G3 S3	2	Scree and gravel slopes and turfey places in alpine tundra	Southwest Wrangell Mountains
<i>Arenaria longipedunculata</i>	longstem Sandwort	Caryophyllaceae	G3Q S3	2	Moist, calcareous, or serpentine gravels and rock crevices	Chitina River
<i>Cerastium regelii</i>	Regel's chickweed	Caryophyllaceae	G4Q S2S3	1	Wet swales of low, calcareous tundra; lake shores; solifluction soil	Northern Wrangell Mountains
<i>Minuartia biflora</i>	mountain stitchwort	Caryophyllaceae	G5 S2	23	Exposed, calcareous, grassy slopes and herb mats having abundant snow cover in winter	Park-wide in the mountains
<i>Stellaria alaskana</i>	Alaska starwort	Caryophyllaceae	G3 S3	23	Rock outcrops, talus slopes, and moraines in alpine tundra	Wrangell, St. Elias, Nutzotin and Mentasta mountains
<i>Stellaria umbellata</i>	umbrella starwort	Caryophyllaceae	G5 S2S3	9	Alpine tundra	Wrangell-St. Elias, Nutzotin, and Chugach Mountains
<i>Ceratophyllum demersum</i>	coon's tail	Ceratophyllaceae	G5 S2	1	Fresh water pools and streams	Copper River Basin

Appendix E. AKNHP Listed Rare Plants Documented to Occur Within Wrangell-St. Elias and Potentially Present within the Analysis Area¹

Scientific Name	Common Name	Family	AKNHP Rank ²	Number of Known Occurrences in the Park	Habitat	Region of the Park and Preserve where Species has been Observed
<i>Sedum divergens</i>	Pacific stonecrop	Crassulaceae	G5 S1	1	Steep rocky slopes, sub-alpine to alpine meadows to ridges	Maritime St. Elias Mountains
<i>Juniperus horizontalis</i>	creeping savin	Cupressaceae	G5 S1S2	8	Rocky and sandy places, bluffs, alluvial fans, woods, and terraces	Southern Wrangell Mountains and Granite Range
<i>Carex adelostoma</i>	circumpolar sedge	Cyperaceae	G4 S1	6	Wet places, moist sites, and fens	Upper and Middle Copper River Basin
<i>Carex atratiformis</i>	black sedge	Cyperaceae	G5T5 S2	1	Open coniferous woods and meadows and floodplains	Mentasta Mountains, Lost Creek floodplain
<i>Carex crawfordii</i>	Crawford's sedge	Cyperaceae	G5 S2S3	1	Well drained lake and river meadows	Tana River
<i>Carex eburnea</i>	bristleleaf sedge	Cyperaceae	G5 S2S3	2	Dry sand or rocky places, preferably on calcareous soil	Chitina River
<i>Carex holostoma</i>	Arctic marsh sedge	Cyperaceae	G4 S2	2	Turfy places in tundra and by the edge of small ponds	Nutzotin Mountains
<i>Carex hoodii</i>	Hood's sedge	Cyperaceae	G4G5 S1	1	Dry to mesic grasslands, rocky slopes, screes, and forest openings	Maritime St. Elias Mountains
<i>Carex lapponica</i>	Lapland sedge	Cyperaceae	G4G5Q S2	3	Lowlands, <i>Sphagnum</i> bogs, wet, nutrient poor areas	Tanana and Ahtna Basin lowlands
<i>Carex laxa</i>	weak sedge	Cyperaceae	G4 S1	2	Wet places, mostly in woods, swamps and muskeg	Tanana lowlands, Nabesna River
<i>Carex lenticularis</i> var. <i>dolia</i>	tufted sedge	Cyperaceae	G5T3Q S3	10	Muddy shores, sheltered ponds, lakes, and river flats	Granite Range, St. Elias Mountains, Ahtna Basin lowlands
<i>Carex parryana</i>	Parry's sedge	Cyperaceae	G4 S1	2	Wet places, gravel bars	Upper Chitina River, Upper White River
<i>Carex phaeocephala</i>	Dunhead sedge	Cyperaceae	G4 S1S2	10	Alpine herbaceous and low shrub	Granite Range, Maritime St. Elias and Nutzotin mountains
<i>Carex tahoensis</i>	Tahoe sedge	Cyperaceae	G3 S1	1	Sagebrush slopes, open rocky and sandy slopes, sub-alpine and alpine meadows	Granite Range
<i>Eriophorum viridicarinarum</i>	large-flower; fleabane	Cyperaceae	G5 S2	1	Sub-alpine and lowland peat meadows	Southern Wrangell Mountains

Appendix E. AKNHP Listed Rare Plants Documented to Occur Within Wrangell-St. Elias and Potentially Present within the Analysis Area¹

Scientific Name	Common Name	Family	AKNHP Rank ²	Number of Known Occurrences in the Park	Habitat	Region of the Park and Preserve where Species has been Observed
<i>Trichophorum pumilum</i> <i>var.rollandii</i>	Rolland's leafless-bulrush	Cyperaceae	G5 S1	2	Bogs, damp, marly lake shores, alkaline seepages, and moist calcareous ground	Upper Chitina River
<i>Astragalus harringtonii</i>	Harrington milk-vetch	Fabaceae	G5T3 S3	3	Meadows, stream banks, and scree slopes	Nutzotin Mountains, Tana and Nabesna rivers
<i>Lupinus kuschei</i>	Yukon lupine	Fabaceae	G3 S2	7	Sandy alluvium, sand dunes, open woods	Sanford, Nabesna and Chisana Rivers
<i>Oxytropis huddelsonii</i>	Huddelson's locoweed	Fabaceae	G3 S2S3	28	Ridge tops, frost boils, alpine tundra, heath, and less commonly in woods	Park-wide in the mountains
<i>Myriophyllum verticillatum</i>	whorlleaf watermilfoil	Haloragaceae	G5 S3	1	Small ponds	Chitina River Basin
<i>Phacelia mollis</i>	soft phacelia	Hydrophyllaceae	G3 S2S3	19	Dry slopes, roadsides, sandy or gravelly soils, rock outcrops and in open woods	Nutzotin, Wrangell, and Chugach Mountains; Granite Range
<i>Maianthemum stellatum</i>	star-flowered; Solomon's seal	Lilaceae	G5 S2	1	Common locally in dry open woodlands, on calcareous river banks or lake shores, tidal flats, open woods, and meadows	Nutzotin Mountains
<i>Najas flexilis</i>	naiad	Najadaceae	G5 S1S2	1	Shallow fresh or brackish water	Lower Chitina River Basin
<i>Botrychium alaskense</i>	Alaska moonwort	Ophiolossaceae	G2G3 S2S3	2	Ericaceous heath, sandy basalt, turfey tundra, disturbed situations in the alpine	Wrangell and Nutzotin Mountains
<i>Botrychium ascendens</i>	triange-lobe moonwort	Ophiolossaceae	G2G3 S2	1	Open mountain slopes and steep screes, from 4,500–5,300 feet elevation	Nutzotin Mountains
<i>Botrychium lineare</i>	narrow-leaf grape fern	Ophiolossaceae	G1 S1	2	Open silty areas, disturbed situations, meadows, variable	Nutzotin Mountains
<i>Botrychium montanum</i>	mountain moonwort	Ophiolossaceae	G3 S1	1	Alpine forb herbaceous scree slopes, wet fens and cedar forests	Maritime St. Elias Mountains
<i>Botrychium tunux</i>	N/A	Ophiolossaceae	G1 S1	1	Floodplains, river bluffs, open sand dunes, and upper beaches on the coast	Nutzotin Mountains
<i>Botrychium yaaxudakeit</i>	N/A	Ophiolossaceae	G2 S2	1	Silty slopes	White River

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Scientific Name	Common Name	Family	AKNHP Rank ²	Number of Known Occurrences in the Park	Habitat	Region of the Park and Preserve where Species has been Observed
<i>Cypripedium parviflorum</i>	lesser yellow lady's slipper	Orchidaceae	G5 S2S3	1	Woods and swamps	Chitina River valley
<i>Papaver alboroseum</i>	pale poppy	Papaveraceae	G3G4 S3	19	Sandy, gravelly soil, and alpine scree slopes	Park-wide in the mountains
<i>Papaver walpolei</i>	Walpole's poppy	Papaveraceae	G3 S3	1	Exposed tundra uplands, especially calcareous fellfield and river gravels	Mentasta Mountains
<i>Agrostis thurberiana</i>	Thurber's bentgrass	Poaceae	G5Q S2	6	Mesic alpine meadows	Malaspina Forelands and Granite Range
<i>Elymus calderi</i>	Calder's wild rye	Poaceae	G3G4 S2S3	1	Dunes, sandy and gravelly hillsides, benches, and roadsides	Dadina River bluff
<i>Festuca lenensis</i>	tundra fescue	Poaceae	G4 S3	9	Gravel and scree slopes	Nutzotin, Mentasta and northern Wrangell mountains
<i>Festuca minutiflora</i>	small-flower fescue	Poaceae	G5 S1	1	Alpine tundra, meadows, and scree slopes	Chugach Mountains
<i>Glyceria pulchella</i>	mannagrass	Poaceae	G5 S2S3	1	Subarctic lowland sedge wet meadow	Tana River and MacKenzie Valley
<i>Poa leptocoma</i>	marsh blue grass	Poaceae	G5 S2	5	Damp places, <i>Vaccinium</i> heaths, moist woods, in loose scree	St. Elias, Nutzotin and Wrangell mountains
<i>Poa secunda</i> subsp. <i>secunda</i>	curly blue grass	Poaceae	G? S1	5	Alpine graminoid herbaceous and floodplain meadows	Granite Mountains, Nabesna River
<i>Puccinellia vahliana</i>	Val's alkali grass	Poaceae	G4 S2S3	1	Non-littoral species, in moist clay by brooks and on snowbeds, stony tundra, and alpine seeps	Northern Wrangell Mountains
<i>Trisetum sibiricum</i> subsp. <i>litorale</i>	Siberian oatgrass	Poaceae	G5T4Q S2	2	Moist grassy slopes and tundra, willow and alder thickets, meadows, and along creeks	Alpine and sub-alpine; Nutzotin Mountains
<i>Phlox hoodii</i>	spiny phlox	Polemoniaceae	G5 S1S2	4	South facing bluffs and scree slopes	Mentasta and Nutzotin mountains
<i>Phlox sibirica</i> subsp. <i>richardsonii</i>	Siberian phlox	Polemoniaceae	G4T2T3Q S2	17	Sandy or gravelly hilltops and barrens, rock outcrops, scree slopes	Mentasta, Nutzotin, and northern Wrangell mountains

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Scientific Name	Common Name	Family	AKNHP Rank ²	Number of Known Occurrences in the Park	Habitat	Region of the Park and Preserve where Species has been Observed
<i>Rumex beringensis</i>	Bering sea dock	Polygonaceae	G3 S3	17	Sandy places on tundra, solifluction lobes, frost boils, broken soil of <i>Dryas</i> tundra	Wrangell and St. Elias mountains
<i>Montia bostockii</i>	Bostock's minerslettuce	Portulacaceae	G3 S3	21	Moist places near springs, mesic alpine tundra slopes	Northern, central Wrangell, Mentasta, and Nutzotin mountains
<i>Potamogeton obtusifolius</i>	blunt-leaf pondweed	Potamogetonaceae	G5 S1	1	Shallow ponds and lakes	Ahtna Basin
<i>Potamogeton subsibiricus</i>	Yenisei River pondweed	Potamogetonaceae	G3 S3	5	Shallow ponds and lakes	Upper Copper River
<i>Douglasia alaskana</i>	Alaskan douglasia	Primulaceae	G2G3 S2S3	1	Sandy soil, gravel, scree slopes, and rocky alpine sites	Southern Wrangell and Chugach mountains
<i>Douglasia arctica</i>	dwarf primrose	Primulaceae	G3 S2S3	1	Rocky, mossy slopes in the mountains	Northern St. Elias Mountains and Mackenzie River
<i>Douglasia gormanii</i>	Gorman's dwarf primrose	Primulaceae	G3 S3	33	Rock outcrops, gravel scree slopes, alpine tundra, and moist alpine slopes	Mentasta, Nutzotin and Northern Wrangell mountains
<i>Cryptogramma stelleri</i>	fragile rock-brake	Pteridaceae	G5 S2S3	6	Crevices in calcareous rocks in shaded localities with dripping water, usually very rare and scattered	Nutzotin and northern Wrangell mountains
<i>Chamaerhodos erecta</i> subsp. <i>nuttallii</i>	little-rose	Rosaceae	G5T5 S1S2	5	South facing bluffs and river terraces	Nabesna River
<i>Potentilla drummondii</i>	Drummond's cinquefoil	Rosaceae	G5 S2	8	Meadows to ridges, subalpine to alpine	Chugach Mountains and Granite Range
<i>Potentilla rubricaulis</i>	Rocky Mountain cinquefoil	Rosaceae	G4 S2S3	2	<i>Dryas</i> graminoid tundra	Granite Range
<i>Salix hookeriana</i>	Hooker willow	Salicaceae	G5 S2	2	Coastal spruce forests and stabilized sand dunes	Malaspina forelands
<i>Salix setchelliana</i>	Setchell's willow	Salicaceae	G4 S3	11	Gravel bars, shores and sandy slopes; pioneer on sandy beaches, margins of glacial rivers, and on glacial moraines	Nabesna, White, Chisana, and Bremner rivers

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Scientific Name	Common Name	Family	AKNHP Rank ²	Number of Known Occurrences in the Park	Habitat	Region of the Park and Preserve where Species has been Observed
<i>Saxifraga adscendens subsp. oregonensis</i>	small saxifrage	Saxifragaceae	G5T4T5 S2S3	8	Moist gravelly and rocky alpine situations	Chugach, southern Wrangells, St. Elias mountains and Granite Range
<i>Saxifraga nelsoniana subsp. porsildiana</i>	Porsild's saxifrage	Saxifragaceae	G5T3T4 S2	1	Hillsides and along streams, sub-alpine to alpine	Northern Wrangell Mountains
<i>Castilleja miniata</i>	scarlet Indian paintbrush	Scrophulariaceae	G3 S3	6	Alpine and sub-alpine meadows	Malaspina forelands and Southern Wrangell Mountains
<i>Limosella aquatica</i>	mudwort	Scrophulariaceae	G5 S3	1	Wet, muddy, or sandy pond margins	Malaspina forelands
<i>Pedicularis macrodonta</i>	muskeg lousewort	Scrophulariaceae	G4Q S3	1	Swamps, wet meadows, and muskeg	Malaspina forelands
<i>Viola selkirkii</i>	N/A	Violaceae	G5 S3	1	Moist woodlands	Southern Wrangell Mountains

¹ As targeted presence/absence surveys have not been conducted throughout the park, the lack of data does not indicate that these species may not be present within additional regions of the park.

² G1: Critically imperiled globally, 5 or less occurrences
 G2: Imperiled globally, 6 to 20 occurrences
 G3: Either very rare and local throughout its range or found locally in a restricted range, 21 to 100 occurrences, threatened throughout its range.
 G4: Widespread and apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery.
 G5: Demonstrably secure globally, though it may be quite rare in parts of its range.
 T#: Global rank of the described subspecies or variety.
 G#G#: Global rank of species uncertain, best described as a range between the two ranks
 G#Q: Indicates some uncertainty about taxonomic status that might affect global rank
 S1: Critically imperiled in the state, 5 or fewer occurrences.
 S2: Imperiled in the state, 6–20 occurrences.
 S3: Rare or uncommon in the state, 21–100 occurrences.

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APPENDIX F
ANILCA Section 810(a) Summary Evaluation and Findings

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APPENDIX F

ANILCA SECTION 810(A) SUMMARY EVALUATION AND FINDINGS

I. Introduction

This section was prepared to comply with Title VIII, Section 810 of the Alaska National Interest Lands Conservation Act (ANILCA). It summarizes the evaluations of potential restrictions to ANILCA subsistence uses and needs which could result from proposed actions within the management plan/environmental impact statement (EIS) for managing off-road vehicle (ORV) use in the Nabesna District of Wrangell-St. Elias National Park and Preserve. The EIS also describes non-motorized trail opportunities in the district.

II. The Evaluation Process

Section 810(a) of ANILCA states:

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

(1) gives notice to the appropriate State agency and the appropriate local committees and regional councils established pursuant to section 805;

(2) gives notice of, and holds, a hearing in the vicinity of the area involved; and

(3) determines that (A) such a significant restriction of subsistence uses is necessary, consistent with sound management principles for the utilization of the public lands, (B) the proposed activity will involve the minimal amount of public lands necessary to accomplish the purposes of such use, occupancy, or other disposition, and (C) reasonable steps will be taken to minimize adverse impacts upon subsistence uses and resources resulting from such actions."

ANILCA created new units and additions to existing units of the national park system in Alaska. Wrangell-St. Elias National Park and Preserve was created by ANILCA, section 201(9), for the following purposes:

"To maintain unimpaired the scenic beauty and quality of high mountain peaks, foothills, glacial systems, lakes, and streams, valleys, and coastal landscapes in their natural state; to protect habitat for, and populations of, fish and wildlife including but not limited to caribou, brown/grizzly bears, Dall sheep, moose, wolves, trumpeter swans and other waterfowl, and marine mammals; and to provide continued opportunities including reasonable access for mountain climbing, mountaineering, and other wilderness recreational activities. Subsistence uses by local residents shall be permitted in the park, where such uses are traditional, in accordance with the provisions of Title VIII."

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

III. Proposed Action on Federal Lands

The National Park Service (NPS) is considering **six** alternatives for managing ORV use in the Nabesna District of Wrangell-St. Elias National Park and Preserve. This planning effort focuses on nine trails that were the subject of a 2006 lawsuit concerning recreational ORV use, but it also addresses subsistence ORV use both on and off these trails as well as non-motorized trails and routes in the district. A full discussion of the alternatives and their anticipated effects is presented in the EIS. The alternatives are summarized briefly below with particular attention to subsistence resources and uses.

Alternative 1 (No Action Alternative): This alternative reflects the present management direction, guided by the park's General Management Plan (NPS 1986) and the conditions of the 2007 lawsuit settlement. No trail improvements would occur. Trail maintenance would continue at current levels. NPS-qualified subsistence users would continue to employ ORVs for subsistence purposes on all nine trails and throughout the analysis areas. Recreational ORV use would be permitted on portions of seven of the nine trails. No new non-motorized trails or routes would be considered for layout, marking or construction.

Alternative 2: This alternative reflects the pre-lawsuit conditions. No major trail improvements would occur. Trail maintenance would continue at current levels. NPS-qualified subsistence users would continue to employ ORVs for subsistence purposes on all nine trails and throughout the analysis areas. Recreational ORV use would be permitted on all nine trails. No new non-motorized trails or routes would be considered for layout, marking or construction.

Alternative 3: This alternative attempts to address resource impacts through administrative actions combined with limited investment in trail improvements. The Soda Lake Trail would be re-routed from Lost Creek to Platinum Creek to avoid private property and bypass most of the degraded trail segments. No other trail improvements would occur, but trail maintenance would continue at current levels. NPS-qualified subsistence users would continue to employ ORVs for subsistence purposes on all nine trails and throughout the analysis areas. Recreational ORV use would not be permitted on any of the nine trails. Several non-motorized routes or trails would be laid out or constructed. Transects would be established on degraded portions of seven of the trails in order to monitor the resource impacts of trail use. If monitoring indicates that resource impacts are increasing over time, action will be taken to address the problem through management of ORVs used for subsistence.

Alternative 4: This alternative seeks to provide reasonable access while protecting park resources through improvements that would bring eight of the nine trails to a design-sustainable or maintainable condition. Once 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 the planned design standard. NPS-qualified subsistence users would continue to employ ORVs for subsistence purposes on all nine trails and throughout the analysis areas, subject to monitoring and management actions when necessary in response to unacceptable impacts. Prior to trail improvements, NPS would permit recreational ORV use on the Lost Creek and Trail Creek trails. After the improvements, recreational ORV use would also be permitted on the Caribou Creek, Soda Lake, and Reeve's Field trails. Recreational ORV use would not be permitted on trails in the national park or on the Suslota trail. Several non-motorized routes or trails would be laid out or constructed.

Alternative 5: This alternative provides access for backcountry and wilderness activities while addressing resource concerns through trail improvements, resource monitoring, and designation of subsistence ORV trails in designated wilderness. Eight trails would see trail improvement on the most degraded segments to design-sustainable or maintainable condition. Some improvements would also be made on the ninth trail, though the trail would still not meet the definition of sustainable or maintainable. Improvements would also be made to certain trails in designated wilderness that are used for subsistence access. NPS-qualified subsistence users would continue to employ ORVs for subsistence purposes on all nine trails, subject to monitoring and management actions when necessary in response to unacceptable impacts. Subsistence ORV use off existing trails outside of designated wilderness would be permitted as long as the use does not result in unacceptable resource impacts. If standards for any impact indicator are exceeded, newly created trails would be closed. On the trail systems in designated wilderness (Black Mountain and the trails south of Tanada Lake), subsistence ORV users would be required to stay on designated trails. Once trails are improved to at least maintainable condition, recreational ORV use would be permitted on both park and preserve trails. 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 standards. Several non-motorized routes or trails would be laid out or constructed.

Alternative 6: (agency's preferred alternative and environmentally preferred alternative): This alternative seeks to provide reasonable access while protecting park resources through improvements that would bring nine of the nine trails to at least a maintainable condition. Once 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 the planned design standard. NPS-qualified subsistence users would continue to employ ORVs for subsistence purposes on all nine trails and throughout the analysis areas, subject to monitoring and management actions when necessary in response to unacceptable impacts. Prior to trail improvements, NPS would permit recreational ORV use on the Lost Creek and Trail Creek trails. After the improvements, recreational ORV use would also be permitted on the Suslota, Caribou Creek, Soda Lake, and Reeve's Field trails. Recreational ORV use would not be permitted on trails in the National Park. Several non-motorized routes or trails would be laid out or constructed.

IV. Affected Environment

A summary of the affected environment pertinent to subsistence use is presented here. The following documents contain additional descriptions of subsistence uses within Wrangell-St. Elias National Park and Preserve:

Bleakley, Geoffrey T. 2002. *Contested Ground, An Administrative History of Wrangell-St. Elias National Park and Preserve, Alaska, 1978-2001*, NPS Alaska Region.

Final Environmental Impact Statement, Wilderness Recommendation, NPS Alaska Region, 1988.

Marcotte James R. 1992. *Wild fish and game harvest and use by residents of five Upper Tanana communities, Alaska, 1987-88*. ADF&G Division of Subsistence, Technical Paper No. 168.

Norris, Frank. 2002. *Alaska Subsistence: A National Park Service Management History*, NPS Alaska Region.

NPS Alaska Region. 1986. *General Management Plan/Land Protection Plan, Wrangell-St. Elias National Park and Preserve*.

NPS Alaska Region. 1988. *Wrangell-St. Elias Subsistence Management Plan*. (Updated most recently in 2004.)

NPS Alaska Region. *Wrangell-St. Elias National Park and Preserve Subsistence Users Guide*. (Updated most recently in 2005.)

Haynes, Terry L., Martha Case, James A. Fall, Libby Halpin, and Michelle Robert. 1984. *The use of Copper River salmon and other wild resources by Upper Tanana communities, 1983-1984*. ADF&G Division of Subsistence, Technical Paper No. 115.

Stratton, Lee, and Susan Georgette. 1984. *Use of fish and game by communities in the Copper River Basin, Alaska: a report on a 1983 household survey*. ADF&G Division of Subsistence, Technical Paper No. 107.

Subsistence uses by qualified rural residents are allowed within Wrangell-St. Elias National Park and Preserve in accordance with Titles II and VIII of ANILCA. Only NPS-qualified subsistence users may hunt or trap within the national park. State-regulated (sport) fishing and federal subsistence fishing are also allowed in the national park. The national preserve is open to federal subsistence uses as well as state authorized general (sport) hunting, trapping, and fishing activities. The proposed actions would affect federal public lands within both the national park and the national preserve.

To engage in federal subsistence activities within Wrangell-St. Elias National Park, individuals must live in one of the park's 23 resident zone communities, live within the park, or have a special subsistence use permit issued by the park superintendent. The following communities are designated as resident zones for the park: Chisana, Chistochina, Chitina, Copper Center, Dot Lake, Gakona, Gakona Junction, Glennallen, Gulkana, Healy Lake, Kenny Lake, Lower Tonsina, McCarthy, Mentasta Lake, Nabesna, Northway, Slana, Tanacross, Tazlina, Tetlin, Tok, Tonsina, and Yakutat (36 CFR 13.1902). Rural residents who do not reside in the park or a resident zone community, but who have (or are members of a family that has) customarily and traditionally engaged in subsistence activities in the park, without the use of aircraft, may continue to do so pursuant to a subsistence eligibility permit issued by the park superintendent in accordance with federal regulations (36 CFR 13.440). To engage in subsistence activities under federal regulations within Wrangell-St. Elias National Preserve, individuals are not required to live in the resident zone, but they must live in a rural Alaskan community or area that has a positive customary and traditional use determination for the species and the area where they wish to hunt, fish or trap.

Based on 2000 U.S. Census data compiled by the Alaska Department of Community and Economic Development, the National Park Service estimates that approximately 6,000 individuals are eligible to engage in federal subsistence activities in Wrangell-St. Elias National Park and Preserve. These activities include hunting, trapping, fishing, berry picking, gathering mushrooms and other plant materials, collecting firewood, and harvesting timber for house construction.

The landscape within Wrangell-St. Elias National Park and Preserve ranges from forests and tundra to the rock and ice of high mountains. The region's main subsistence resources are salmon, moose, caribou, Dall sheep, mountain goat, ptarmigan, grouse, snowshoe hare, furbearing animals, berries, mushrooms, and dead and green logs for construction and firewood. Most subsistence hunting within Wrangell-St. Elias National Park and Preserve occurs off the Nabesna, McCarthy, and Kotsina roads. The Copper, Nabesna, Chisana and Chitina rivers serve as popular riverine access routes for subsistence users. Most of the subsistence fishing takes place in the Copper River.

The Nabesna District is a popular moose and sheep hunting area, and these are the major subsistence wildlife resources commonly accessed via the trails addressed in this EIS. Other subsistence wildlife resources in the area include grizzly and black bear, furbearers, and waterfowl. During the 1970s, caribou were harvested in the area (Record 1983: 147). The fish species documented in the district during the park's recent freshwater fish inventory included arctic grayling, burbot, lake trout, whitefish, and slimy sculpin (Markis et al. 2004). Vegetation along the Nabesna Road consists of black spruce wetlands, mixed spruce uplands, birch and alder, mixed tussock tundra, willow/shrub communities, and open lichen/feather moss meadows. Blueberries and low-bush cranberries (also known as lingonberries) are harvested in the late summer and fall.

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

V. Subsistence Uses and Needs Evaluation

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

The evaluation criteria are:

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

The potential to reduce populations:

The impact to subsistence wildlife resources from the proposed alternatives ranges from negligible to moderately negative, depending on the alternative. The most influential factor in this is changes in hunting pressure in response to trail conditions and administrative actions such as closures. Physical disturbances to habitat from the proposed trail improvements and continued ORV use play a secondary role in the potential of the various alternatives to impact subsistence wildlife populations.

Under Alternatives 1 and 2, growth in ORV use in the Nabesna District is projected to be limited, largely associated with hunting. Small increases in hunting pressure over time are anticipated to result in minor negative impacts on subsistence wildlife resources, largely through displacement of animals and limited growth in harvest.

Under Alternative 3, there would be very limited trail improvements, with the potential to cause very minor and temporary disturbance of wildlife resources during construction. Eliminating recreational ORV use will likely result in decreased hunting activity. Consequently the impact of this alternative on subsistence wildlife resources is expected to be negligible.

The trail improvements, re-routes, and construction proposed in Alternatives 4, 5, and 6 may cause the minor and temporary disturbance and displacement of wildlife resources; however, this is not expected to result in wildlife population declines, substantial habitat losses, or any long-term population movements. More importantly, ORV use and with it hunting pressure are expected to

increase with improved access from the proposed ORV trail improvements. In addition, some of the proposed non-motorized routes and trails could improve access to areas that have thus far seen only limited hunting activity. More hunters will be getting further into the park and preserve backcountry, displacing animals in their wake and potentially increasing harvest levels as well. Should an unsustainable increase in harvest levels occur, the Federal Subsistence Board and the Alaska Board of Game could modify seasons, harvest limits (e.g., horn or antler restrictions), or both. However, this also means that subsistence users will likely have to travel further to harvest animals, which will especially be a hardship for non-motorized subsistence hunters and those with less powerful ORVs. Consequently, Alternatives 4, 5, and 6 are anticipated to have a moderate negative impact on the numbers and distribution of important subsistence wildlife resources.

The proposed action alternatives as well as the no-action alternative would have at most a minor effect on subsistence fish resources. Under Alternatives 1 and 2, none of the degraded stream crossings would be improved, although ORV use at most of the degraded crossings would be reduced under Alternative 1. This could result in moderate disturbance of fish or their habitat. This is not anticipated to result in a significant impact to subsistence fish resources, however. Under Alternative 3, only one of the degraded crossings would be improved, although some of the others would have reduced levels of ORV use. Minor disturbance of fish or their habitat might result. Under Alternatives 4, 5, and 6 the degraded stream crossings identified by ADF&G would largely be repaired or replaced, with use being reduced on the few crossings that are not replaced or improved. These actions would result in minor improvements in fish habitat.

The effect on subsistence access:

Access for federal subsistence uses in the Wrangell-St. Elias National Park and Preserve is granted pursuant to Section 811 of ANILCA. Allowed means of access by federally qualified subsistence users in Wrangell-St. Elias National Park and Preserve include motorboat, snowmachine (subject to frozen ground conditions and adequate snow cover), ORVs, and airplane (preserve only), along with non-motorized means such as foot, horses, and dog teams. Under current federal regulations, the Superintendent may restrict or close a route or area if he or she determines that the means of access is causing or may cause an adverse impact, subject to notice and a public hearing (36 CFR 13.460 (a) and (b)).

The NPS determined in the 1986 *Wrangell-St. Elias General Management Plan* that the “use of off-road vehicles (ORVs), including all-terrain vehicles (ATVs), for subsistence purposes may be permitted on designated routes, where their use was customary and traditional, under a permit system implemented by the superintendent” (page 178).

With no trail improvements and recreational ORV use allowed on most or all trails, trail conditions are not expected to improve under Alternatives 1 and 2 and could deteriorate somewhat. This could have a minor negative impact on subsistence access, but is not anticipated to result in a significant restriction on subsistence uses.

The Soda Lake Trail re-route and elimination of recreational ORV use on all nine trails proposed under Alternative 3 could result in a minor improvement in trail conditions and thus on subsistence access.

The trail improvements proposed under Alternative 4 would result in a significant improvement in the condition of the degraded trails and thus result in improved access for subsistence users.

Under Alternatives 5 and 6, significant improvements in the condition of the degraded trails would occur, improvements would also occur on certain trails within designated wilderness south of Tanada Lake and in the Black Mountain area, and subsistence ORV use in designated wilderness would be restricted to designated trails. Although the restrictions on subsistence ORV use in wilderness would reduce the area where subsistence users could take their ORVs, the overall impact of this would be improved access for subsistence users.

Alternatives 3, 4, 5, and 6 include monitoring of trail conditions and could result in closure of trails or areas to subsistence ORV use if resource damage is documented. While this would affect subsistence access, it does not represent a change in regulatory authority from the current condition. Instead it simply describes a process for implementing the current authority.

The potential to increase competition:

Evaluation of the potential to increase competition for subsistence resources is based primarily on projected trends in the level of recreational ORV use of the nine trails. A high percentage of recreational ORV use in Wrangell-St. Elias is in support of state-regulated hunting in the national preserve.

Under Alternative 1, a slight increase in recreational ORV use may occur, consistent with existing trends in ORV use, however, this increase is not anticipated to result in a significant increase in competition for subsistence resources.

Under Alternative 2, little if any increase in recreational ORV use is anticipated. Thus, no increase in competition for subsistence resources is anticipated.

Under Alternative 3, recreational ORV use of the nine trails will not be permitted. This is likely to result in a decrease in competition for subsistence resources.

Alternatives 4, 5, and 6 would result in significant improvements in the condition of most of the recreational ORV trails in the Nabesna District, improving ease of access. Improved access may attract additional general (sport) hunters to the trails in the Nabesna District, with the potential to increase competition for the area's wildlife resources. It is difficult to predict the potential level of increased competition; however, it is not anticipated to significantly restrict subsistence activities.

VI. Availability of Other Lands

The EIS and this evaluation have described and analyzed the proposed alternatives. The proposed actions are consistent with NPS mandates, ANILCA, and the General Management Plan for the park and preserve. No other alternatives that would reduce or eliminate the use of public lands needed for subsistence purposes were identified. The amount of land affected by the proposed action is minimal in relation to the overall amount of federal public land in the park and the preserve, and it is possible for subsistence users to utilize other lands both inside and outside the park and preserve.

VII. Alternatives Considered

The EIS and this evaluation have described and analyzed the proposed alternatives. No other alternatives were considered that would reduce or eliminate the need to use public lands needed for subsistence purposes.

VII. Findings

This analysis concludes that the alternatives discussed in this EIS will not result in a significant restriction of subsistence uses.

APPENDIX G

Wilderness Minimum Requirements Decision Guide

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APPENDIX G

WRANGELL–ST. ELIAS NATIONAL PARK AND PRESERVE MINIMUM REQUIREMENTS DECISION GUIDE

The Minimum Requirements Decision Guide (MRDG) is a process to identify, analyze, and select management actions that are the minimum necessary for wilderness administration. It applies direction from the Wilderness Act and incorporates a two-step process. Step 1 determines whether administrative action is necessary. If action is found to be necessary, then Step 2 provides guidance for determining the minimum activity. Step 2 has been referred to as determining the minimum tool but could include any type of activity, method, or equipment.

The MRDG can be used as:

- A process for evaluation and documentation
- A guide to help discuss proposals with interested parties; or
- A review of on-going management practices to determine if they are necessary or if a less intrusive practice can be implemented.

The MRDG is designed to assist with preparation of a NEPA analysis, if needed, but is not a substitute for a NEPA analysis. Portions of the MRDG may be transferable to a subsequent NEPA analysis.

Agency NEPA guidelines do not necessarily require a process to determine if administrative action in wilderness is necessary or to select the administrative activity that causes the least adverse effect to the wilderness resource and character. The MRDG provides a method to determine the necessity of an action and how to minimize impacts; NEPA analysis compares and discloses the environmental effects of alternatives, documents a decision and requires public involvement.

Step 1: Determine if any administrative action is necessary.

Description:

It is necessary to manage trails in the Nabesna district to provide continued opportunities for appropriate and reasonable access to wilderness and backcountry recreational activities. These trails existed prior to establishment of the park, are mostly used by Off-Road Vehicles (ORVs), and are currently in degraded condition. These trails also accommodate subsistence and access to inholdings. Reasonable access needs to be provided while protecting wilderness, fish and wildlife habitat, and other park resource values. A portion of the existing trail system runs through designated wilderness and much of the remaining portion runs through areas determined in the 1986 General Management Plan (GMP) and wilderness suitability review to be eligible wilderness.

To determine if administrative action is necessary, answer the questions listed in A–F on the following pages.

A. Describe Valid Existing Rights or Special Provisions of Wilderness Legislation

Are there valid existing rights or is there a special provision in wilderness legislation (the Wilderness Act of 1964 or subsequent wilderness laws) that allows consideration of action involving Section 4(c) uses? Cite law and section.

Section 811(b) of ANILCA provides in part that “notwithstanding any other provisions of this Act or other law, the Secretary shall permit on the public lands appropriate use for subsistence purposes...means of surface transportation traditionally employed for such purposes by local rural residents, subject to reasonable regulation.” The NPS implemented this provision in 36 CFR 13.460. If ORVs were traditionally used in a park area for subsistence purposes, such use may continue, even in wilderness, so long as the ORV does not cause or is not likely to cause an adverse impact to park resources and values. Wrangell-St. Elias National Park and Preserve (WRST) has determined that ORVs were traditionally employed for subsistence.

Section 1110(b) of ANILCA and regulations at 43 CFR part 36 govern access to inholdings in National Park system units in Alaska. Provision for adequate and feasible access is granted to owners of valid property rights within WRST notwithstanding any other law, so the agency can consider and grant access including permanent facilities, motorized equipment and mechanical forms of transportation in wilderness in compliance with the regulations. The regulations at 43 CFR 36.10 address routes and methods specifically.

B. Describe Requirements of Other Legislation

Do other laws require action?

ANILCA provides the specific guidance on this issue.

NEPA mandates that any federal project or any project that requires federal involvement be scrutinized for its impact on the natural and human environment and that reasonable alternatives for accomplishing the project purpose be considered. Impacts to designated and eligible wilderness resulting from a range of six management alternatives are displayed in the Nabesna ORV EIS.

C. Does taking action conform to and implement relevant standards and guidelines and direction contained in agency policy, unit and wilderness management plans, species recovery plans, tribal government agreements, or state, local government, or interagency agreements?

Section 811 of ANILCA states that “rural residents engaged in subsistence uses shall have reasonable access to subsistence resources on public lands”...and “...the Secretary shall permit on the public lands appropriate use for subsistence purposes of snowmachines, motorboats and other means of surface transportation traditionally employed for such purposes by local residents, subject to reasonable regulations.” The 1986 General Management Plan for WRST made the determination that ORVs were a traditional means of access for subsistence purposes.

Subsistence ORV use is allowed in WRST in designated and eligible wilderness. Title 36 CFR 13.460 implements ANILCA Section 811. If ORVs were traditionally used in a park area for subsistence purposes, such use may continue, even in wilderness, so long as the ORV use does not adversely impact park resources and values. The GMP states “Based on the access inventory and ORV study, the superintendent will close routes, designate routes, or impose restrictions on the season of use, type and size of ORV vehicles, vehicle weight, or the number of trips. The restrictions will be imposed to protect park resources and values by preventing the damage the ORV use can cause, while at the same time providing reasonable access pursuant to Section 811 of ANILCA.”

For designated wilderness, ANILCA makes no exceptions for recreational ORV use, including use of ORVs to access sport hunting. Consequently, no recreational ORV use has been or will be authorized in designated wilderness in WRST. Recreational ORV use has been permitted on trails in areas determined in the 1986 GMP to be eligible wilderness under 43 CFR 36.11(g)(2). These trails existed prior to the establishment of the park and have long been used as a means of access for sport hunting, which is still permitted in the preserve.

For eligible wilderness, NPS Management Policies 2006, Section 6.3.1 states “The NPS will take no action that would diminish the wilderness eligibility of an area possessing wilderness characteristics until the legislative process of wilderness designation has been completed. Until that time, management decisions pertaining to lands qualifying as wilderness will be made in expectation of eventual wilderness designation.” Effects to wilderness characteristics in eligible wilderness from motorized use and from proposed trail improvements are evaluated in Chapter 4 of the Nabesna ORV EIS.

D. Describe Options Outside of Wilderness

Can this situation be resolved by an administrative activity outside of wilderness?

Within the Nabesna ORV EIS, no alternative is considered that eliminates subsistence ORV use in designated wilderness. Under the existing condition, it is the conclusion of the analysis that no unacceptable impacts to wilderness character or impairment are occurring. Management actions are considered within the range of alternatives that would repair trails in designated wilderness, designate trails, and eliminate off-trail use.

Closure of these existing motorized trails in the designated wilderness would constitute a significant restriction of access to those individuals who utilize the trails to access subsistence sheep and moose hunting opportunities.

Subsistence ORV use will also continue to occur in eligible wilderness under all alternatives considered within the EIS, though management actions are considered, based on monitoring of resource impacts, that could result in limitations on off-trail use, vehicle class restrictions, or trail closures.

For recreational ORV use, none is permitted in designated wilderness. For trails in eligible wilderness, alternatives are considered that would close trails to recreational ORV use, repair trails, and designate repaired trails (with no off-trail use permitted).

Most lands in the analysis area are either designated or eligible wilderness and there are few areas outside of designated or eligible wilderness that are available for the rerouting of existing trails.

E. Wilderness Character

Is it necessary to take administrative action to preserve wilderness character, as described by the qualities listed below.

Qualities: Untrammled, undeveloped, natural, outstanding opportunities for solitude or a primitive and unconfined type of recreation, other unique components that reflect the character of the wilderness.

Following is description of the impacts to these wilderness characteristics under the existing conditions for both designated and eligible wilderness. The Nabesna ORV EIS describes a range of management alternatives that have varying levels of impacts on these characteristics. These effects are described in Chapter 4 of the Nabesna ORV EIS.

Untrammelled Quality

Designated Wilderness

Section 2(c) of the Wilderness Act states that wilderness is “hereby recognized as an area where the earth and its community of life are untrammelled by man.” Untrammelled” means “allowed to run free” (American Heritage Dictionary 1992, from Landres et al. 2008]). According to the referenced interagency wilderness strategy (Landres et. al. 2008), “Actions that intentionally manipulate or control ecological systems inside wilderness degrade the untrammelled quality of wilderness character, even though they may be taken to restore natural conditions or for other purposes. For example, wilderness is manipulated and the untrammelled quality of wilderness character is diminished when naturally ignited fires are suppressed inside wilderness, dams are built that impede natural water flow, selected animals or plants are removed, or trails are improved with manmade items such as GeoBlocks. Wilderness is also manipulated when restoration actions remove trees and fuels that have accumulated because of fire suppression, herbicides are used to control certain plants, or wildlife populations are manipulated by actions that provide food or water. This concept of trammeling applies to all manipulation since the time of wilderness designation but does not apply to manipulations that occurred prior to wilderness designation, such as the use of fire by native people to promote game habitat, because the mandates of the Wilderness Act don’t apply prior to designation.”

Under the above approach, indicators relative to the “untrammelled” quality include the extent of actions by federal land managers and actions not authorized by federal land managers. Few known management activities affect the designated wilderness lands within the analysis area. The NPS has documented a very low level of management activity within designated wilderness; there have been no specific actions to manage animal populations, no fire suppression, and no stocking of fish in the wilderness lakes. Based on those measures, the untrammelled quality of designated wilderness lands in the analysis area appears to be high.

Eligible Wilderness

Indicators relative to the “untrammelled” quality include the extent of actions by federal land managers and actions not authorized by federal land managers. On six existing trails classified as being on eligible lands (Caribou Creek, Lost Creek, Trail Creek, Soda Lake, Reeve Field, and Boomerang), the NPS has continued to permit the recreational use of ORVs, primarily as a means to access sport hunting in the preserve. There is also a lesser component of subsistence ORV use on these trails and the Soda Lake and Reeve Field trails are used for accessing private inholdings. There has been very little trail maintenance associated with these trails. There were some (less than 0.25 mile total) trail hardening materials applied to the Reeve Field trail as part of an NPS research project in the mid-1990s. In 2008, there was gravel applied to the first 0.5-mile of the Caribou Creek trail. Trailheads are within the Nabesna road corridor, classified as ineligible. There have been no specific actions to manage animal populations, but sport hunting occurs within the preserve portions and subsistence hunting occurs in both park and preserve. There has been limited fire suppression, and no stocking of fish in eligible wilderness lakes. Based on the continued authorization of recreational ORV use and limited improvements associated with it, there has been minor diminishment of the untrammelled quality of eligible wilderness lands in the analysis area.

In summary, it would not be necessary to take administrative action to preserve the untrammeled character of designated or eligible wilderness. But taking management action will also not affect the untrammeled quality by intentionally manipulating or controlling ecological systems.

Natural Quality

Designated Wilderness

Landres et al. (2008) indicate that “wilderness should be free from the effects of ‘an increasing population, accompanied by expanding settlement and growing mechanization’ and that the ‘earth and its community of life...is protected and managed so as to preserve its natural conditions’ (Section 2(a) and 2(c), respectively).” Ecological systems inside wilderness are directly affected by things that happen inside as well as outside of the wilderness, and by actions taken by agencies or citizens inside wilderness. For example, non-indigenous fish are intentionally introduced for recreational fishing, yet have far-reaching unanticipated negative effects on native biological diversity and nutrient cycling in wilderness lakes; livestock grazing may be allowed in wilderness, yet may contribute to soil disturbance and the spread of non-indigenous plants; biological control agents may be used to eradicate invasive non-indigenous plants, yet may have unintended effects on indigenous plants; dams outside wilderness alter hydrological flow regimes, adversely affecting the riparian plant communities within wilderness; and air pollutants from sources outside wilderness disperse long distances, affecting wilderness vegetation, soils, and aquatic systems (Landres et al. 1998).

Indicators relative to the natural quality include plant and animal communities, physical resources, and biophysical processes. Specific measures indicate that plant and animal communities within the analysis area designated wilderness largely remain in their natural state. The NPS has not documented any non-indigenous species in the designated wilderness in the analysis area; no indigenous species are extinct or listed as threatened, endangered, sensitive or of concern in the analysis area; and there is no permitted grazing in the designated wilderness in the analysis area. The only known change in plant community composition associated with NPS management would involve alterations to vegetation from ORV use along the trails used for that purpose.

Measures identified for the physical resources indicator show that the natural quality of air, water, and soil resources remains high, in general. Visibility is generally excellent within the designated wilderness. NPS does not have data on other air quality measures, which relate to ozone air pollution and acid deposition. Baseline water quality monitoring was conducted in 2004 and did not indicate issues for water bodies in the analysis area designated wilderness (Veatch et al. 2004; see Section 3.4.3 for specific discussion). There is some evidence of human-caused stream bank erosion present at unimproved fords within the designated wilderness. Total disturbance to soil resources along trails in the designated wilderness is estimated at approximately 90 acres, suggesting impacts to soils are occurring.

Measures related to the biophysical processes indicator involve the fire regime, climate change, pathways for movement of non-indigenous species, and the potential for loss of connectivity with the surrounding landscape. Fire suppression has not been practiced in the analysis area and the fire regime remains natural. The extent and magnitude of global climate change in the wilderness area is unknown. While applicable data are limited, the NPS assumes that the 35 miles of ORV trails and 7 remote landing strips within the designated wilderness could serve as pathways for movement of non-indigenous species, but no evidence of such movement has been documented to date. Based on the limited sources of potential interference with natural biophysical processes, it is assumed that loss of connectivity with the surrounding landscape is minimal.

In summary, the available measures for the three indicators discussed above show no change or minimal influence on the natural quality of the designated wilderness. Therefore, the natural quality of the designated wilderness within the analysis area is considered to be high.

Eligible Wilderness

Indicators relative to the natural quality include plant and animal communities, physical resources, and biophysical processes. Specific measures indicate that plant and animal communities within the analysis area eligible wilderness largely remain in their natural state. The NPS has not documented any non-indigenous species in the eligible wilderness in the analysis area. Exotic species have been documented within the Nabesna road corridor (classified as ineligible) and not all trails have been surveyed for exotic species. No indigenous species are extinct or listed as threatened, endangered, sensitive or of concern in the analysis area; and there is no permitted grazing in the eligible wilderness in the analysis area. The only known change in plant community composition associated with NPS management would involve alterations to vegetation from ORV use along the trails used for that purpose. Within eligible wilderness, segments of the Boomerang, Reeve Field, and Soda Lake trails have experienced plant community changes in braided portions.

Measures identified for the physical resources indicator show that the natural quality of air, water, and soil resources remains high, in general. Visibility is generally excellent within the eligible wilderness. NPS does not have data on other air quality measures, which relate to ozone air pollution and acid deposition. Baseline water quality monitoring was conducted in 2004 and did not indicate issues for water bodies in the analysis area eligible wilderness (Veach et al. 2004; see Section 3.4.3 for specific discussion). There is some evidence of human-caused stream bank erosion present at unimproved fords within the eligible wilderness on the Caribou Creek, Lost Creek, Trail Creek, Soda Lake, Reeve Field, and Boomerang trails. Total disturbance to soil resources along trails in the designated wilderness is estimated at approximately 59 acres, suggesting impacts to soils are occurring.

Measures related to the biophysical processes indicator involve the fire regime, climate change, pathways for movement of non-indigenous species, and the potential for loss of connectivity with the surrounding landscape. Fire suppression has not been practiced in the analysis area and the fire regime remains natural. While applicable data are limited, the NPS assumes that the 44 miles of ORV trails within the designated wilderness could serve as pathways for movement of non-indigenous species, but no evidence of such movement has been documented to date. Based on the limited sources of potential interference with natural biophysical processes, it is assumed that loss of connectivity with the surrounding landscape is minimal.

The available measures for the three indicators discussed above show some influence on the natural quality of the eligible wilderness. Therefore, the natural quality of the eligible wilderness within the analysis area is considered to be moderately diminished.

In summary for both designated and eligible wilderness, by improving management of ORV use in the area, natural wetlands drainage that has been affected by random trail alignments could be improved. The potential spread of invasive plants could be reduced.

Undeveloped Quality

Designated Wilderness

Wilderness is defined in Section 2(c) of the 1964 Wilderness Act as “an area of undeveloped Federal land retaining its primeval character and influence, without permanent improvements or human

habitation,” with “the imprint of man’s work substantially unnoticeable.” Indicators relative to the undeveloped quality include non-recreational structures, installations, and developments; inholdings; use of motorized vehicles, motorized equipment, or mechanical transport; and loss of statutorily protected cultural resources.

Measures for the non-recreational structures indicator apply to authorized and unauthorized developments. The NPS has documented a number of authorized physical developments in the designated wilderness area including 13 remote airstrips or landing spots (seven of which are within the analysis area) and four cabins (two support subsistence use and two are permitted for use by outfitter/guides). There are no known unauthorized (user-created) developments. There are no existing or potential inholdings in the designated wilderness within the analysis area.

The NPS has documented a number of motorized use types in the designated wilderness including subsistence ORV use, aircraft use, and limited administrative use of ORVs and aircraft. ORV use in support of subsistence activity in the wilderness is estimated at 55 trips per year in the Black Mountain area and less than 40 trips per year on trails in the wilderness south of Tanada Lake. ORV use has resulted in degraded conditions in some locations within the wilderness, particularly along the South Copper Lake trail. Such visible evidence of mechanized use diminishes the undeveloped quality of the wilderness in these specific locations.

Aircraft are used to access the 13 remote landing strips and several larger lakes used by float planes. This motorized use is primarily associated with hunting activity and transport for hikers and climbers, although the level of activity is not known. Administrative use is limited to occasional ranger patrols on ORVs (estimated at one trip per year in the wilderness, aircraft overflights, and rare use of helicopters [hunting patrols in the past two years and emergency use to access an injured hunter are the only known use of helicopters in the past five years]). Additionally, some unauthorized recreational ORV use occurs in the designated wilderness.

There are no known disturbances to cultural resources within the designated wilderness in the analysis area. Consequently, measures for two of the indicators for undeveloped quality of the wilderness within the analysis area are negative (i.e., there has been no change). By contrast, as discussed above there are multiple occurrences of non-recreational developments and motorized uses within the wilderness. Based on these indicators, there has been moderate diminishment of the undeveloped quality of the wilderness within the analysis area.

Eligible Wilderness

For eligible wilderness within the analysis area, the NPS has documented a number of authorized physical developments in the area, including two remote airstrips, one cabin permitted to an outfitter/guide concession, and one public use cabin that replaced an existing shack. There are no known unauthorized (user-created) developments. There are no private inholdings within the eligible wilderness in the analysis area.

The NPS has documented a number of motorized use types in the eligible wilderness including subsistence and recreational ORV use, aircraft use, chainsaw use, and administrative use of ORVs and aircraft. ORV use on 43.7 miles of trail in support of subsistence activity in the eligible wilderness is estimated at 155 trips per year for the Trail Creek, Lost Creek, Soda Lake, Reeve Field, Caribou, and Boomerang trails combined. Recreational ORV use is estimated at 417 trips per year on the same trails. ORV use has resulted in degraded conditions in some locations within the eligible wilderness, particularly along the Reeve Field, Soda Lake, and Boomerang trails. Such visible

evidence of mechanized use diminishes the undeveloped quality of the eligible wilderness in these specific locations.

Within eligible wilderness, aircraft are used to access the 2 remote landing strips and several larger lakes used by float planes. This motorized use is primarily associated with hunting activity and transport for hikers and climbers, although the level of activity is not known. Administrative use includes occasional ranger patrols on ORVs and support for various field crews (estimated at 30 trips per year over the six trails). Aircraft, including fixed wing and helicopter, are frequently used for ranger patrols, field crew support, or maintenance.

There are no known disturbances to cultural resources within the eligible wilderness in the analysis area. Consequently, measures for two of the indicators for undeveloped quality of the eligible wilderness within the analysis area are negative (i.e., there has been no change). By contrast, as discussed above there are occurrences of non-recreational developments and motorized uses within the eligible wilderness, as well as resource impacts associated with motorized trails. Based on these indicators, there has been moderate diminishment of the undeveloped quality of the wilderness within the analysis area.

In summary for both designated and eligible wilderness, an improved management strategy for OHV use would provide opportunities to limit and contain the affects to the undeveloped character by closing trails, realigning or consolidating use, limiting off trail use, or stopping the recreational use of OHVs.

Solitude or Primitive and Unconfined Recreation Quality

Designated Wilderness

The Wilderness Act states in Section 2(c) that wilderness has “outstanding opportunities for solitude or a primitive and unconfined type of recreation... Given the complexity of human interactions with their environment and other people, the intent of monitoring this quality is not to understand people’s experiences, perceptions, or motivations in wilderness. Instead, this monitoring strategy focuses on the mandate in the Wilderness Act to provide outstanding opportunities and to monitor how these opportunities are changing over time” (Cole 2004, Dawson 2004).

Landres et al. (2008) identify four indicators relative to the solitude or primitive and unconfined quality. They include remoteness from sights and sounds of people inside the wilderness, remoteness from occupied and modified areas outside of wilderness, presence of facilities that decrease self-reliant recreation, and management restrictions on visitor behavior. The amount of visitor use is a key measure for the remoteness from sights and sounds of people indicator. Based on trail counts, ORV permits, and transporter/outfitter guide information, the NPS estimates visitors to the designated wilderness are few in number, at approximately 1,280 visitor days of use per year. The number of trail contacts is estimated at 20 per year. Campsites in the backcountry are highly dispersed and their number is not known. The NPS estimates that 40 percent of the wilderness acreage within the analysis area is within sight or sound of motorized travel routes.

With respect to remoteness from influences from outside of the wilderness, the analysis area wilderness is sufficiently remote that there are no impacts to night sky visibility. Approximately 20 percent of the wilderness acreage is affected by motorized travel routes in adjacent non-wilderness areas. The soundscapes within the wilderness are affected by ORV use in adjacent areas and by aircraft activity. Both of these sound sources are most likely to occur during the hunting season,

which is generally the period of highest visitor use. Sound from ORV use is generally limited to areas close to the trails open to such use.

While there are no agency-provided facilities that decrease self-reliant recreation, there are a number of remote airstrips that support sport and subsistence hunting in the National Preserve or fly-in wilderness recreation trips in the National Park or Preserve. With respect to management restrictions, there are very few regulations applicable to visitors accessing the wilderness. The lack of required backcountry permits, registration, or pre-departure educational programs makes the experience more primitive.

Based on the indicators and measures discussed above, there has been minor to moderate overall diminishment of the quality for solitude or primitive and unconfined recreation. This characterization is based primarily on the influences from access and travel activity originating outside of the wilderness and the presence of user-created facilities that support fly-in use of the wilderness.

Eligible Wilderness

For the eligible wilderness within the analysis area, the NPS estimates visitors at approximately 8,000 visitor days of use per year (this excludes the Nabesna road corridor, which is not eligible). The number of trail contacts is estimated at 25 per year. Campsites are highly dispersed and their number is not known. The NPS estimates that 40 percent of the eligible wilderness acreage within the analysis area is within sight or sound of motorized travel routes.

With respect to remoteness from influences from outside of the eligible wilderness, the analysis area eligible wilderness could receive minor impacts to night sky visibility, primarily from vehicle traffic or lights associated with development along the Nabesna road or Tok Cut-off highway. Approximately 30 percent of the eligible wilderness acreage is affected by motorized travel routes in adjacent non-eligible areas. The soundscapes within the eligible wilderness are affected by ORV use and by aircraft activity. Both of these sound sources are most likely to occur during the hunting season, which is generally the period of highest visitor use.

With respect to management restrictions, there are very few regulations applicable to visitors accessing the eligible wilderness. The lack of backcountry permits, registration, or pre-departure educational programs makes the experience more primitive.

Based on the indicators and measures discussed above, there has been moderate overall diminishment of the quality for solitude or primitive and unconfined recreation within the eligible wilderness. This characterization is based primarily on the influences from access provided by the Nabesna road and the six motorized trails within the eligible wilderness.

In summary for both designated and eligible wilderness, improved management of OHV use could result in trail closures or temporal uses which could improve the opportunity for solitude or primitive and unconfined recreation in some areas.

F. Describe Effects to the Public Purposes of Wilderness

Is taking administrative action consistent with the public purposes for wilderness (as stated in Section 4(b) of the Wilderness Act) of recreation, scenic, scientific, education, conservation, and historical use?

Yes, in that it balances providing reasonable access to subsistence resources, opportunities for wilderness recreation, and access to inholdings with resource protection. ORV use in designated wilderness may not be consistent with these public purposes, but because ANILCA and the GMP have allowed this use, some management is desirable to minimize impacts.

Step 1 Decision: Is any administrative action necessary?

Yes, in order to improve the conditions described under Section E.

Step 2: Determine the minimum tool

Description of Alternative Actions

Table G-1 displays the effects of each alternative considered within the Nabesna ORV EIS on the four wilderness characteristics as well as the alternative comparison criteria listed in the Minimum Requirements Decision Guide. Impacts to eligible wilderness were based on the 1986 eligibility assessment for Alternative 1 and the proposed eligibility revision for Alternatives 2 through 6.

Other Alternative Comparison Criteria

Special Provisions: Explain how the special provisions and rights identified in the Wilderness Act (sections 4 and 5) or subsequent legislation (such as provisions of ANILCA), are managed to minimize degradation of wilderness character.

- Alternative 1: No trail improvements would occur. Subsistence ORV use projected to remain at current low levels. Subsistence ORV users can travel off existing trails in all areas (including designated wilderness).
- Alternative 2: No trail improvements would occur and recreational ORV use would be permitted on all trails (but not in designated wilderness). Subsistence ORV use projected to be similar to current low levels in designated wilderness. Subsistence ORV users can travel off existing trails in all areas (including designated wilderness).
- Alternative 3: Minimal trail improvements and no recreational ORV use permitted on any trails. This would reduce impacts on eligible wilderness. Subsistence ORV use projected to be similar to current low levels in designated wilderness. Subsistence ORV users can travel off existing trails in all areas (including designated wilderness).

Table G-1: Description of Impacts (for each alternative, top row = designated wilderness, bottom row = eligible wilderness)

	Untrammelled Quality	Natural Quality	Undeveloped Quality	Opportunities for Solitude	Heritage and Cultural	Unimpaired Character	Cost of Proposed Improvements
Alternative 1	No effect	Negligible	Moderate	Negligible	Minor to moderate	No impairment	\$0
	No effect	Moderate	Moderate	Moderate			
Alternative 2	No effect	Negligible	Moderate	Negligible	Minor to moderate	No impairment	\$0
	Negative	Negligible	Minor	Minor			
Alternative 3	No effect	Negligible	Moderate	Negligible	Negligible to minor	No impairment	\$443,385
	Negligible	Negligible	Moderate	Negligible			
Alternative 4	No effect	No effect	Major	Moderate	Minor to moderate	Impairment, based on off-trail use in designated wilderness	\$3,229,013
	Moderate	Moderate	Moderate	Moderate			
Alternative 5	No effect	Negligible	Minor	Moderate	Minor to moderate	No impairment, based on containment of off-trail impacts	\$3,979,685
	Negligible to minor	Negligible	Negligible to moderate	Moderate			
Alternative 6	No effect	No effect	Minor	Moderate	Minor to moderate	No impairment, based on containment of off-trail impacts	\$4,336,482
	Moderate	Moderate	Moderate	Moderate			

Step 2 (continued)

- Alternative 4: Trail improvements proposed on eight of nine trails and in designated wilderness. Subsistence ORV use projected to at least double in the designated wilderness, with no controls over off-trail use. This would result in major impacts to the undeveloped character of wilderness.
- Alternative 5: Trail improvements proposed on eight of nine trails and in designated wilderness. Subsistence ORV use would not increase significantly over current levels and subsistence ORV users would be required to stay on designated trails in designated wilderness.
- Alternative 6: Trail improvements proposed on nine of the nine trails and in designated wilderness. Subsistence ORV use projected to increase over current levels and subsistence ORV users would be required to stay on designated trails in designated wilderness, with allowance for game retrieval.

Step 2 Decision: What is the Minimum Tool?

Select the alternative that represents the minimum requirements necessary to administer the area as wilderness. Describe the rationale for selecting it.

Based on Table G-1, Alternative 3 (no recreational ORV use permitted, minimal trail improvements) has the lowest level of impacts to the four wilderness characteristics, while still providing some degree of access to subsistence ORV users and inholders.

Approvals	Signature	Name	Position	Date
Prepared by:		Bruce Rogers	Environmental Protection Specialist	4/30/10
Recommended:		Judy Alderson	AKRO Wilderness Coordinator	5/4/10
Approved:		Meg Jensen	WRST Superintendent	5/4/10