

National Park Service  
U.S. Department of the Interior

Denali National Park and Preserve  
Interior Region 11 – Alaska

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# Nenana River Trails

## *Environmental Assessment*

*March 2023*





As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural and cultural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to assure that their development is in the best interests of all. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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If you wish to comment on this document, you may mail comments to:

Denali National Park Planning Team  
PO Box 9  
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You may also comment for this project online at <http://parkplanning.nps.gov>. Retrieve Nenana River Trails to provide comments electronically.

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, be aware that your entire comment – including your personal identifying information – may be made publicly available at any time. You can ask us to withhold your personal identifying information from public review, but we cannot guarantee that we will be able to do so.

## **ON THE COVER**

View of Mt. Fellows from the bluffs above the Nenana River. This view would be seen from the proposed Nenana River Trails analyzed in the Environmental Assessment.

Photo by Jared Zimmerman, National Park Service

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# 1 Proposed Action

The National Park Service (NPS) is considering developing approximately 17 miles of trail near the Nenana River in Denali National Park and Preserve (Denali). This non-wilderness area proposed for trail development is on the eastern boundary of the park, between the George Parks Highway (Parks Highway) and the Nenana River (Figure 1). This environmental assessment (EA) will also refer to the project area as the Nenana River corridor.

Of the approximately 17 miles of trail proposed for construction, approximately eight would be a multiuse trail open to both pedestrians and bicyclists. This trail would be approximately eight feet wide and would primarily have a crushed gravel surface. The remaining approximately nine miles of trail would be open to pedestrians only and would be approximately one to two feet wide with a primarily natural surface. Trails would be built to accessibility standards per the Architectural Barriers Act (ABA) from each trailhead to the extent feasible. The southernmost approximately one mile of hiking trail would create a two-mile universally accessible loop when combined with the southernmost mile of the multiuse trail (Figure 2).

A bridge accommodating both bicycles and pedestrians would cross Riley Creek and connect the trails to the Riley Creek day use area. Additional site-specific compliance based on final designs would be required for the bridge prior to implementation.

In addition to wayfinding signage on the trails, there may be other facilities constructed along the trails, including benches, interpretive signs, or overlook areas. These additional facilities would be concentrated near trailheads and would require additional site-specific compliance if implemented.

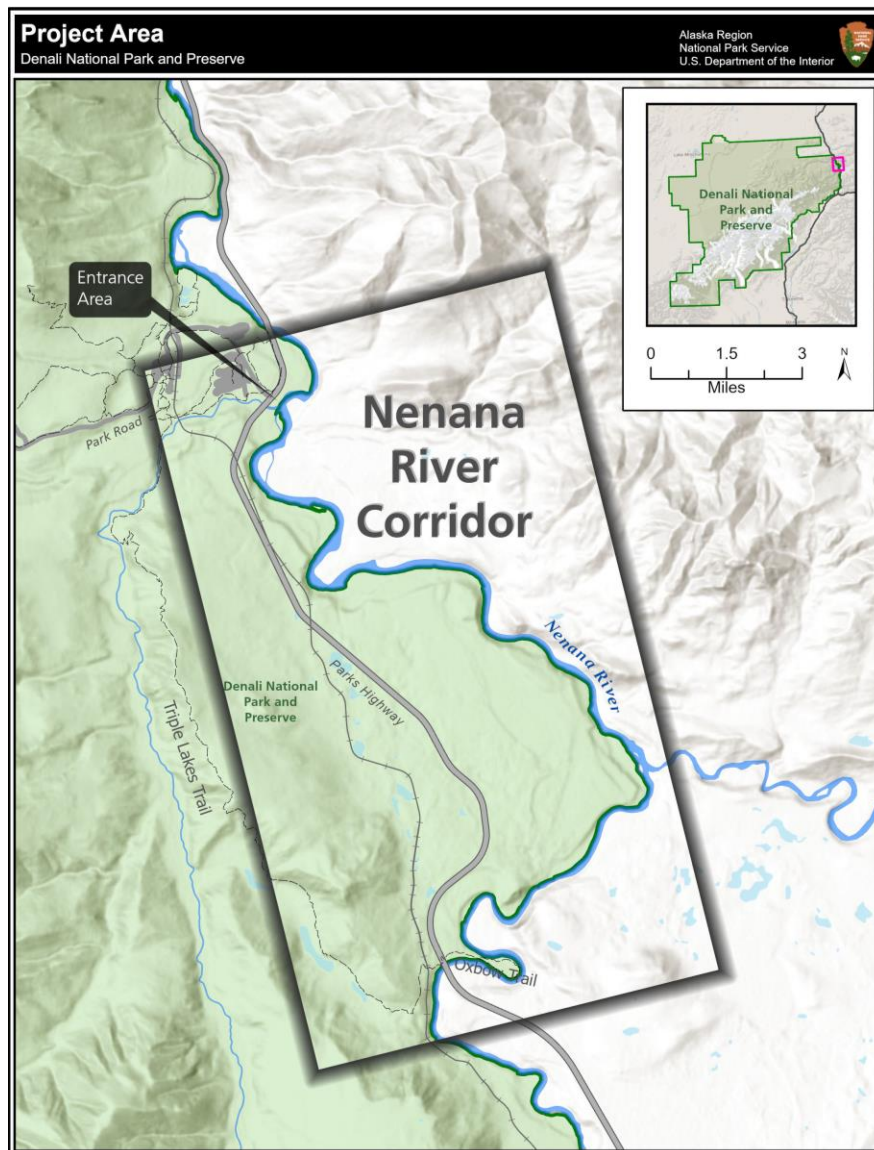
No other facilities would be constructed on or near the trails under the proposed action.

All trails would be open for their respective day uses year-round. Overnight camping would continue to be prohibited. The NPS does not currently have plans to groom winter trails in this area, although it may in the future as allowed for in the *2020 Winter and Shoulder Season Visitor Services EA* (NPS, 2020).

Commercial use would be allowed on the trails under existing laws, NPS policies, and park planning documents. Any new commercial uses that may be proposed in the future would be evaluated by standard park compliance and commercial services processes.

Additional detail about the Proposed Action analyzed in this EA is in Chapter 5, Alternatives (pg. 7).

**Figure 1. Location of Nenana River Corridor in Denali National Park and Preserve**



## 2 Purpose and Need

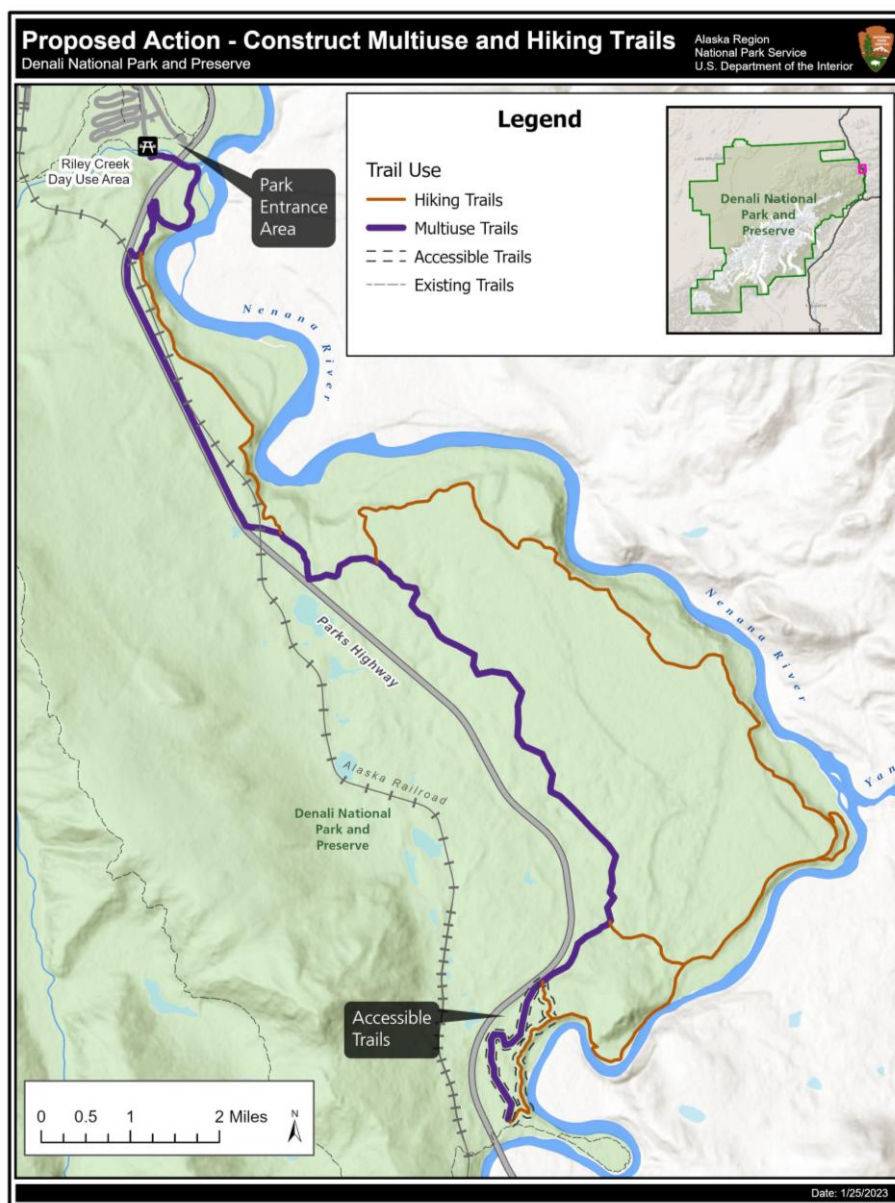
The proposed action is needed to fulfill longstanding management direction to provide a variety of visitor recreational opportunities in this easily accessible, frontcountry, non-wilderness area of the park originally outlined in the *1997 Frontcountry Development Concept Plan* (NPS, 1997; NPS, 2006b). Although the Nenana River corridor is easily accessible and close to other infrastructure, large areas retain a primarily natural setting. The purpose of providing developed recreational opportunities here is to encourage many visitors to interact with the landscape of the park in a way that does not depend on access to the Park Road and does not impact wilderness (NPS, 2012). This type of developed recreational opportunity that immerses visitors in the natural landscape on a

lengthy trail is underrepresented in the park and stands in contrast to the road-based, frontcountry, or wilderness backcountry opportunities otherwise available to visitors.

In addition to expanding what is available to park visitors, these developed recreational opportunities are also intended to enhance multimodal connections to the park and increase universally accessible recreational opportunities in Denali as described in the *2018 Denali National Park and Preserve Long Range Transportation Plan* (NPS, 2018).

The proposed action is one of several NPS and non-NPS projects potentially affecting the Nenana River corridor, underscoring the need for an assessment of the Proposed Action at this time. These other projects are described in Chapter 6 of this EA, Affected Environment and Environmental Consequences (pg. 18).

**Figure 2. Proposed Action – Construct Multiuse and Hiking Trails**



### 3 Background and Context

The Nenana River corridor is part of the former Mount McKinley National Park, and is ineligible for wilderness designation. As such, it is considered part of the park's frontcountry and is managed under the *1997 Frontcountry Development Concept Plan* (DCP) rather than the *2006 Backcountry Management Plan*. Although the Nenana River corridor is open year-round for day use, it is currently seldom used for recreation beyond the existing Oxbow trail on the southern end of the project area.

Development of trails in the Nenana River corridor was originally proposed in the *1997 Frontcountry DCP*. The *1997 Frontcountry DCP* describes a hiking trail along the Nenana River and a hike-in campground with up to 15 sites to be located near the confluence of the Yanert and Nenana rivers (NPS 1997).

The NPS has considered developing trails in the Nenana River corridor several times since the original 1997 proposal, most recently during broad-scope trail and transportation planning processes from 2016 to 2021. Civic engagement efforts during this time indicated a public desire for a multiuse trail connection to the park entrance area through the Nenana River corridor.

Developed features in and near the Nenana River corridor currently include the Oxbow trail, and the Triple Lakes trail on the southern end of the project area. In 2022, following the *2017 Milepost 231 Wayside and Trail Connections EA* (NPS, 2017), the Alaska Department of Transportation & Public Facilities (DOT) constructed a trailhead and parking area to serve these existing trails. The northern end of the Nenana River corridor includes the Riley Creek day use area adjacent to the Riley Creek campground and park entrance area.

A number of potential future projects may also involve the Nenana River corridor. The projects briefly listed below are discussed at more length in Chapter 6 of this EA (pg. 18):

- A pedestrian bridge over the Nenana River at the southern end of the Nenana River corridor connecting lodging and residential areas to the trailhead at mile 231 of the Parks Highway
- Development of multiuse pathways along the Parks Highway from Cantwell to Healy
- Construction of a mostly buried liquefied natural gas (LNG) pipeline through the Nenana River corridor
- Realignment of the section of the Alaska Railroad going through the Nenana River corridor moving the railroad tracks on the east side of the Parks Highway to the west side of the highway

## 4 Issues

### Issues Selected for Detailed Analysis

Issues selected for detailed analysis identify resources that could be affected, either beneficially or adversely, by implementing any of the proposed alternatives. The NPS used an interdisciplinary review process, existing studies and data, and public comments to determine which resources would likely be affected by this project. Issues were retained for detailed analysis in this EA if they met one or more of the following criteria:

- the environmental impacts associated with the issue are central to the proposal or of critical importance;
- a detailed analysis of environmental impacts related to the issue is necessary to make a reasoned choice between alternatives;
- the environmental impacts associated with the issue are a big point of contention among the public or other agencies; or
- there are potentially significant impacts to resources associated with the issue.

The following issues will be evaluated for each alternative:

#### **Wildlife:**

Increasing the number of visitors on the landscape in the Nenana River corridor would increase the potential for human-wildlife interactions, leading to disturbance and displacement of individual animals, the potential for unsafe wildlife encounters, and the potential for habituation and food conditioning.

Development of trails in the Nenana River corridor would fragment wildlife habitat and alter wildlife movement patterns.

#### **Vegetation and Wetlands:**

Trail development would remove approximately 11 acres of vegetation and would require the fill or disturbance of 0.6 acres of wetlands.

Development of trails could lead to vegetation composition change, particularly immediately adjacent to trail corridors.

Construction and use of trails in the Nenana River corridor could introduce invasive species to the area.

#### **Cultural Resources:**

The development of trails and the introduction of visitor use in the Nenana River corridor could increase the potential for cultural resource disturbance.

## **Recreation Resources and Visitor Experience:**

Creating developed recreational opportunities in the Nenana River corridor would introduce infrastructure and visitor use to an area of the park that largely has neither, increasing the amount of bicycle and pedestrian activity in the area.

Trail development would increase the miles of developed trails in the park available to visitors and would decrease the overall amount of trailless terrain in Denali.

Establishment of a multiuse trail would increase non-motorized connectivity between the park entrance area and nearby visitor accommodations and residential areas.

## **Issues Considered but Dismissed**

The following issues were identified, considered, and dismissed from further analysis:

**Soundscapes:** Construction of trails in the Nenana River corridor would involve the use of machinery, which would increase anthropogenic noise in the surrounding landscape. This additional noise would only be present during trail construction, and use of the trails after construction is not expected to substantially affect the soundscape. The proximity of the Parks Highway, frequent overflights, and the presence of the Nenana River itself create an existing energetic soundscape in the Nenana River corridor (i.e., the area is filled with sound). The relative impact of additional mechanical noise into this environment would be less than in other park areas with lower ambient sound levels. Soundscape impacts could be further minimized by concentrating the use of mechanical equipment to low-visitation times of year when possible, requiring noise-reducing equipment modifications, and by routing any helicopter use over the Parks Highway rather than wilderness areas. Given the temporary nature of the construction actions analyzed in this EA, soundscapes were dismissed from detailed analysis.

**Safety:** Safety impacts from the construction and use of trails in the Nenana River corridor were considered but dismissed from detailed analysis due to the availability of mitigation strategies. The development analyzed in this EA would take place in an area of the park that currently has very little visitor use, and sections of trail would only be open to public use once completed. The public would therefore be kept away from areas under active construction. Equipment and material staging would likewise be kept away from visitor areas when possible. When this is not possible, signage and barriers would keep visitors aware of and away from staging areas. Visitor use of any NPS lands or facilities, including those analyzed in this EA, poses some degree of risk. These risks would be mitigated using trail design allowing for adequate sight distances to avoid user and wildlife conflicts and by signage and visitor education regarding proper behavior around wildlife. With these mitigation strategies in place, the development of facilities analyzed in this EA would pose no more safety risk than other similar facilities in the park, and safety was dismissed from further analysis.

**Other Resources:** The NPS also considered but dismissed from further analysis other possible resources that are not known to exist in the area including Indian Trust Resources, cultural resources protected by the Native American Graves Protection and Repatriation Act, and threatened and endangered species. The Nenana River corridor is not open to subsistence use and would not impact subsistence use of Denali National Park and Preserve. The proposed project area is outside of designated or eligible wilderness and would not impact wilderness resources.

## 5 Alternatives

### **Alternative 1: No Action**

Under the No Action alternative, no additional multiuse, hiking, or accessible trails, overlooks, signs, bridges, or other facilities would be constructed in the project area. The area would remain open for off-trail day use throughout the year. No formalized winter trails or recreational opportunities would be created. Potential commercial use of the area would be evaluated and managed under existing laws, NPS policies, park planning documents, and park compliance and commercial services processes.

### **Alternative 2: Construct Multiuse and Hiking Trails**

#### ***(Proposed Action and Preferred Alternative)***

The Proposed Action would create a total of approximately 17 miles of trail in the Nenana River corridor.

Of this total, approximately eight miles would be a multiuse trail designed for safe concurrent use by bicyclists and pedestrians. The multiuse trail would be approximately eight feet wide and would have a primarily crushed and compacted gravel surface. Trail location and design would create adequate sightlines, grades, and curves with sight distances designed to reduce wildlife and user conflicts as well as discourage fast cycling speeds.

An additional approximately nine miles of trail in the project area would be open to pedestrians only. The majority of these hiking trails would be approximately one to two feet wide with a primarily natural surface.

The southernmost mile of the hiking trails would form a universally accessible loop from the trailhead at mile 231 of the Parks Highway in conjunction with the southernmost mile of the multiuse trail. This mile of accessible pedestrians-only trail would be approximately five feet wide and would have a crushed and compacted gravel surface.

In addition to wayfinding signage on the trails, other facilities may be constructed along the trails, including benches, interpretive signs, or overlook areas. These additional facilities would be concentrated near trailheads and would be similar to those found in other areas of the park.

An approximately eight-foot-wide bridge allowing for safe concurrent use by pedestrians and cyclists would cross Riley Creek and connect the trail system to the Riley Creek day use area on the northern end of the project area. As of early 2023, this bridge is conceptual and would require site-specific compliance based on final designs prior to implementation. The bridge could be constructed as a single span of 250' or as two 125' segments. One 125' span would be sufficient to cross the stream channel, while a second 125' span would improve accessibility and keep the trail out of the floodplain on the north side of Riley Creek.

Ice jams on Riley Creek occasionally occur from freeze-up to break-up, and evidence of ice pushing up and damaging trees is evident along upstream stretches of the creek's banks. An overall bridge span of 250', in either one or two segments, would allow for water, ice, and debris to flow under the bridge during flood events. The bridge structure would also be located well above the 100-year flood level to minimize the potential for damage from moving ice floes and debris.

Each bridge span would be a prefabricated steel truss or similar design. If possible, the Riley Creek bridge would share design elements with the planned pedestrian crossing of the Nenana River at mile 231 of the Parks Highway to provide an iconic and consistent visitor experience.

Concrete abutments or driven piles would support the bridge. If two 125' spans were used, the concrete pier between the two segments would be located out of the stream channel. Additional site-specific compliance based on final designs would be required for the bridge prior to implementation. The bridge would be designed to minimize impacts to the Riley Creek floodplain as described above, and would include other best management practices to minimize the potential for impacts to water quality and other resources during construction.

No other facilities would be constructed on or near the trails under the proposed action.

All trails would be open for their respective uses year-round. Although the *2020 Winter and Shoulder Season Visitor Services EA* authorized motorized grooming of trails in this area, the NPS does not intend to formalize any winter recreational activities or trails in the project area as of 2023.

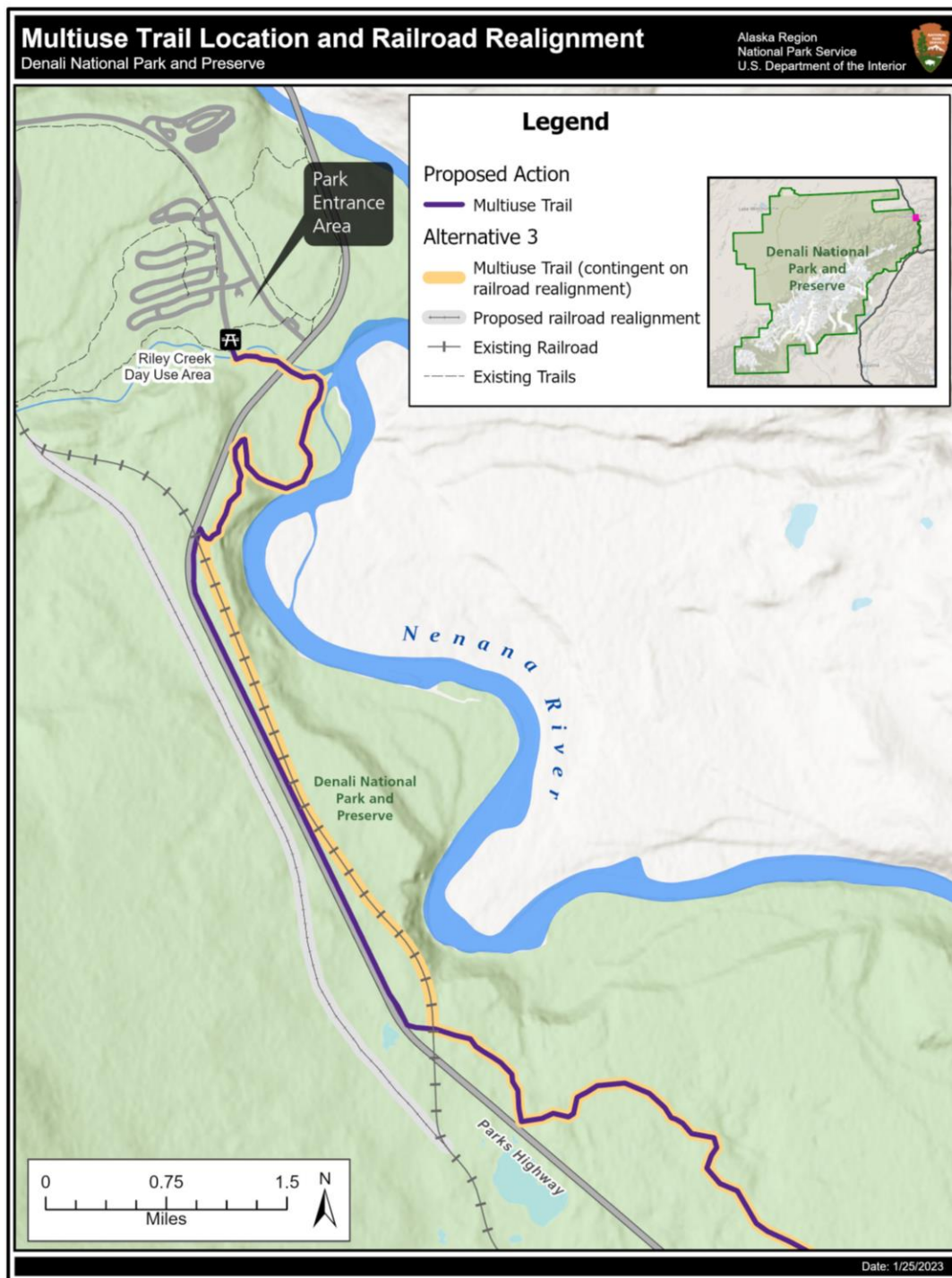
Commercial use would be allowed on the trails under existing laws, NPS policies, and park planning documents. Any novel commercial uses that might be proposed in the future would be evaluated by standard park compliance and commercial services processes.

### Proposed Action and Alaska Railroad Realignment

The exact alignment of the multiuse trail in the Proposed Action between the two railroad crossings of the Parks Highway (approximately mile 234 to 236 of the Parks Highway) depends to an extent on whether the Alaska Railroad in this area is realigned to the west side of the Parks Highway (Figure 3). This realignment has been proposed several times in recent years but has not received funding or

advanced from a concept to final engineering and design as of early 2023 (Alaska Railroad Corporation, 2018; Alaska Department of Transportation and Public Facilities, 2022).

**Figure 3. Multiuse Trail Location and Railroad Realignment Possibilities**



If constructed prior to the realignment of the Alaska Railroad in this area, the northern section of multiuse trail from approximately mile 234 to mile 236 of the Parks Highway would involve a

crossing of the Alaska Railroad and would need to be in or close to the Alaska Department of Transportation & Public Facilities (DOT) right of way for approximately two miles. The crossing of the Alaska Railroad and use of the DOT right of way would require permits from both agencies.

If the railroad were realigned in this area during or shortly after project initiation, the multiuse trail would occupy the former railroad alignment through the project area.

Construction of the Proposed Action would be phased to provide as much time as possible between project initiation and construction of this section of multiuse trail, allowing for more information to emerge about the possible railroad realignment while still ensuring that a multiuse trail, either in the DOT right of way or on the current railroad alignment, is built in the near future. Proposed phasing:

2023 Phase 1 = Hiking trail Parks Highway mile 231 to Nenana and Yanert rivers confluence

2024 Phase 2 = Hiking trail from Yanert River confluence to Parks Highway mile 234

2025 Phase 3 = Multiuse trail section (allowing only hikers to start with) from mile 234 to mile 231

2026 Phase 4 = Hiking trail from Parks Highway mile 234 to Riley Creek day use area

2027 Phase 5 = Multiuse trail from Parks Highway mile 234 to the park entrance area, either using the DOT right of way if the railroad realignment is not definitive, or on the current railroad location if the realignment is imminent. If the railroad realignment is planned but not imminent, construction of the multiuse trail could be delayed until the railroad realignment is completed.

#### Construction Methods Common to All Action Alternatives

Construction of the trails would involve both hand crews and the use of mechanical equipment such as bulldozers, loaders, excavators, and material haulers. Borrow pits near the trail corridor would be used for aggregate when needed. Approximately one borrow pit would be needed for every mile of trail constructed, depending on the trail surface type and substrate material. Borrow pits would provide up to 50 to 100 cubic yards of material each, depending on the section of trail they are used for. Borrow pit locations would be restored to natural conditions when no longer needed for trail construction by filling them with organic material and vegetation mats generated by trail construction. When necessary, aggregate could be imported from sources outside of the Nenana River corridor.

Boardwalks would be used to cross wetland areas. On trails where only hiking is allowed, these boardwalks would be planks running between supports placed on top of the ground surface. For the multiuse trail, the boardwalk would be suspended above the wetland surface by helical piles driven into the ground. Helicopter use over one or two days could be required to transport boardwalk materials to difficult to reach sections of trail. This could be accomplished during low-visitation times of year and over non-wilderness areas of the park to minimize impacts from helicopter use.

Construction of a bridge over Riley Creek would require the use of heavy equipment. A total of two to three abutments would likely be needed to support the bridge. Construction access to the north abutment would be from the Riley Creek day use area along an existing maintained service road. Construction access to the south abutment would be along the multiuse trail alignment from the Parks Highway bridge over Riley Creek.

When possible, equipment staging and construction activity would be focused away from developed visitor areas. Sections of trail would be opened to visitor use as they are completed to minimize overlap of construction activity and visitor use of the trails.

### Operational Considerations Common to All Action Alternatives

This section provides a summary of some of the park management considerations for the Proposed Action and action alternatives described in the EA. These operational implications are distinct from the environmental consequences analyzed in the EA but provide additional context for the analysis. The information provided here is generalized and is intended to convey only the essential park management implications of the actions described in the EA.

The Proposed Action and other action alternatives will require increased NPS presence in an area of the park that does not currently have much visitor use. Introducing visitor use into the Nenana River corridor would require at a minimum NPS patrols of the trails and trailhead areas. Additional NPS presence would be required to respond to the development of any wildlife issues, dangerous human-wildlife interactions, or other emergencies. Because the Nenana River corridor is separated from the Park Road where most visitor activity takes place, any needed NPS presence required by the actions described in the EA would likely decrease the ability of staff to patrol and respond to other areas in the park.

The maintenance needs of the trails described in the EA would be similar to the needs of other existing comparable trails in the park. The multiuse trail with a compacted gravel surface, for example, would likely be able to go several years without maintenance attention before requiring repairs and upkeep. The hiking-only trails described in the EA would require more frequent but likely less intense maintenance than the multiuse trail. The current approximately 40 miles of developed trail in Denali National Park typically require a seasonal trail crew of eight members to maintain park trails. The addition of the 17 miles of trail described in the Proposed Action and other action alternatives would require an approximate increase of three additional seasonal trail crew members for trail maintenance during some years.

Because the visitor facilities described in the EA are not accessed via the park bus system, it is possible that some visitors may use the area unaware that they are required to pay a park entrance fee. In order to encourage payment of fees, the NPS could visibly identify the area as a recreation fee area and provide a digital way to pay those fees at access points. This could be accomplished with signage at trailheads that includes a QR code directing visitors to an online fee payment system. A second possible method would be to post a ranger at the trailhead near mile 231 of the Parks Highway during peak visitation hours with a recreation.gov tablet for fee collection. If staffing levels allowed, this would enhance fee collection, expose visitors to NPS staff, and would increase overall NPS presence in the Nenana River corridor. Finally, a satellite-connected automatic fee machine could be installed at the trailhead, but providing power to the unit would be an additional consideration.

The table below summarizes mitigations incorporated into the Proposed Action and all other action alternatives as applicable to minimize impacts to resources and visitors.

**Table 1. Mitigations Incorporated into the Proposed Action and Other Action Alternatives**

<b>Resource</b>	<b>Mitigations</b>
<b>Wildlife</b>	Trail construction and debris deposition avoided on the steep, sandy bluffs that provide important insect and pollinator habitat
	Vegetation cut only during times of year least likely to impact nesting birds, per guidelines established under the Migratory Bird Treaty Act
	Trails routed to avoid food-dense areas (e.g., soapberry patches)
	Trails established with adequate sightlines to reduce the possibility for human-wildlife encounters, especially with regard to bicycles on the multiuse trail
<b>Vegetation and Wetlands</b>	When possible, vegetation cut in the fall in preparation for the next year's construction to avoid attracting spruce bark beetles
	Trails routed to minimize the need for vegetation removal and wetlands impacts
	Wetlands addressed with boardwalks rather than fill whenever possible
	Tundra mats saved for revegetation of borrow pits and other disturbed areas whenever possible
	When not hauled off-site for disposal, cut vegetation scattered to encourage decomposition and minimize impacts to vegetation that would be covered by piles of removed vegetation
	Areas disturbed adjacent to trail revegetated using native plant seed mix in year of disturbance
<b>Cultural Resources</b>	Trails routed and infrastructure placed to avoid cultural resource sites
	Archeology monitor on site during project implementation
	Any route changes or borrow pits surveyed for cultural resources prior to trail construction and any discovered cultural resources would be avoided
	If cultural resources or items protected by the Native American Graves Protection and Repatriation Act were discovered during project implementation, all project-related activities in the vicinity of the discovery would be stopped and the park archeologist would be notified immediately. The NPS in consultation with the State Historic Preservation Officer and other consulting parties would determine a course of action.
<b>Visitor Use and Experience</b>	When possible, mechanical equipment or helicopter use concentrated in low-visitation times of year
	Helicopters routed away from wilderness areas or high-visitation areas
	Equipment and construction activity staged away from visitor areas whenever possible
	Signage at trailheads designed to incorporate messaging about safe behavior around wildlife
<b>Soundscapes</b>	When possible, mechanical equipment or helicopter use concentrated in low-visitation times of year
	Helicopters routed away from wilderness areas or high-visitation areas
	Use of noise-reducing backup alarms on motorized equipment whenever possible

### **Alternative 3: Wait for the Railroad Realignment**

Alternative 3 would mirror the Proposed Action except with respect to the multiuse trail.

Under Alternative 3, no section of the multiuse trail would be constructed unless the Alaska Railroad is rerouted to the west side of the Parks Highway from approximately highway mile 234 to 236. This railroad realignment was studied in the *2018 Denali Park Realignment Feasibility Study* conducted by the Alaska Railroad Corporation and was discussed in the *2022 Parks Highway Planning and Environmental Linkages Study* conducted by the Federal Highway Administration in partnership with the Alaska Department of Transportation and Public Facilities and the NPS (Alaska Railroad Corporation, 2018; Alaska DOT, 2022). Although both the DOT and Alaska Railroad Corporation intend for this section of railroad to be realigned, no funding has been allocated for the project and substantial geotechnical, engineering, and administrative issues remain to be addressed.

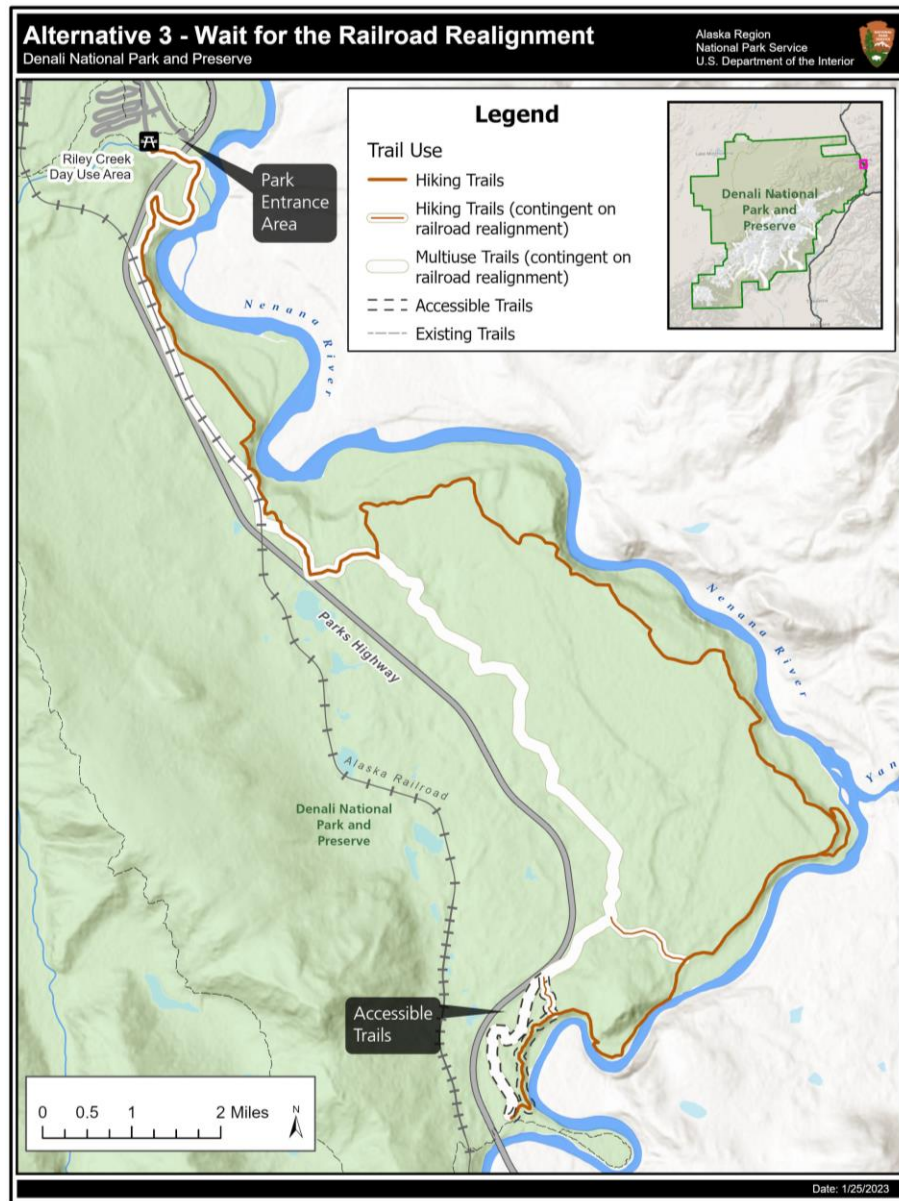
If the railroad were realigned to the west side of the Parks Highway, eight miles of multiuse trail would be constructed under Alternative 3. The multiuse trail would be the same as described in the Proposed Action except for the approximately two-mile section between Parks Highway mile 234 and 236. In this two-mile section, instead of crossing the Alaska Railroad and making use of the DOT right of way, the multiuse trail would use the former railroad alignment.

If the railroad were not realigned, no section of the multiuse trail would be constructed under Alternative 3.

Although there would only be a hiking trail connecting to the Riley Creek day use area prior to the railroad realignment and construction of a multiuse trail, the bridge over Riley Creek would be constructed from the outset to accommodate both bicyclists and pedestrians in anticipation of eventual railroad realignment and multiuse trail construction. Doing so would eliminate the need to construct a hiking-specific bridge and replace it with a multiuse bridge when and if the railroad were to be realigned.

All other aspects of Alternative 3 would be the same as described in the Proposed Action.

**Figure 4. Alternative 3 – Wait for the Railroad Realignment**



#### **Alternative 4: Trails and Campgrounds**

Alternative 4 would be the same as the Proposed Action but would add two small walk-in campgrounds to the trail system (Figure 5).

One campground would be located just to the east of the former gravel pit near mile 234 of the Parks Highway and the other would be located in the vicinity of the confluence of the Nenana River and the Yanert Fork of the Nenana. It could be possible to provide ABA access and ABA-compliant facilities in the campground near milepost 234. This would require an additional approximately 0.25-mile trail to access the campground from the trail network described in the Proposed Action.

Both campgrounds would be rustic and provide three to seven tent pads each. Additional facilities associated with the campgrounds would include cooking shelters with or without picnic tables and other facilities including wildlife safe food storage lockers, water catchment systems as needed, and pit or composting toilets. Campgrounds would potentially require reservations and/or user fees and would not be available for use during winter months. The intent of the campgrounds would be to provide a visitor experience that is distinct from camping in a drive-up campground and from the trailless backpacking otherwise offered in Denali.

#### Operational Considerations of Alternative 4 – Trails and Campgrounds

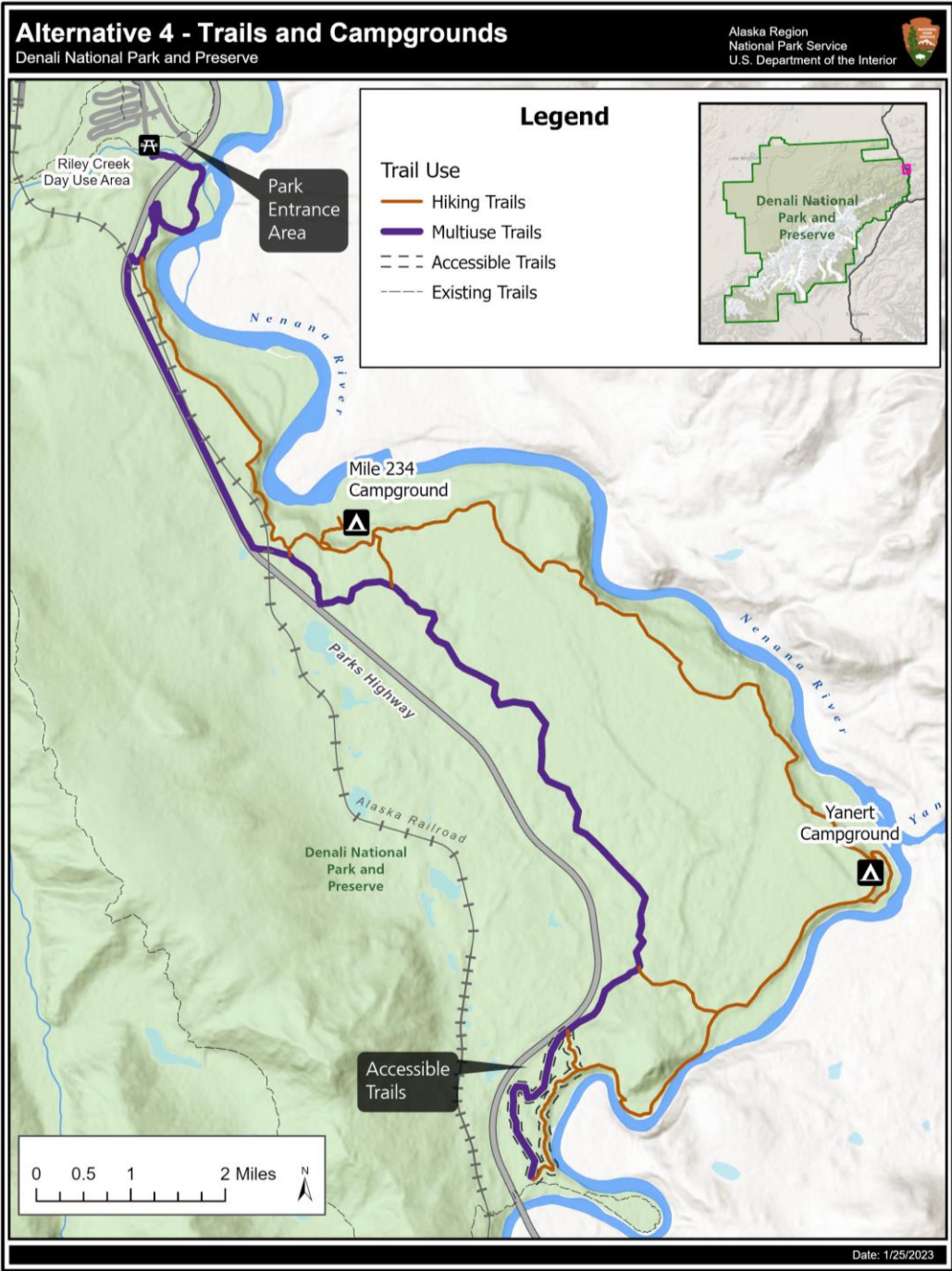
In addition to the operational considerations described on pg. 11, the addition of two small campgrounds under Alternative 4 would have further park management implications. The campgrounds described in Alternative 4 would require additional NPS attention beyond that necessitated by trail use. The increased possibility for human-wildlife interactions in the campgrounds would require additional NPS patrols to monitor safety, ensure food storage and other rules are being followed, and to respond to any food-conditioned wildlife.

Any facilities developed in association with the campgrounds described in Alternative 4 would require additional maintenance attention. This would include frequent patrols to make sure facilities are in working order, to clean and potentially restock restroom facilities, and to replace or refurbish cooking shelters, food storage lockers, tent pads, and restrooms. It is likely that after a number of years, any pit or composting toilets would have to be re-dug and/or human waste would have to be removed from the site. In a similar vein, it is possible that structures associated with the campgrounds would have to be rebuilt or replaced after a number of years.

If campgrounds were developed in the Nenana River corridor under Alternative 4, they would likely require a reservation system. Because the campgrounds described in Alternative 4 would be developed and walk-in, they would be different from any existing campgrounds in the park and would not be a perfect fit with the park's existing vehicle-accessed or backcountry camping reservation and permitting systems. It is possible that a new reservation system would have to be created, or that existing reservation systems would need to be adapted to the new campgrounds in the Nenana River corridor. Whether and how to collect fees for use of the campgrounds would also need to be determined. Management of the reservation system and collection of any fees could be managed either by NPS staff or the park's transportation concessioner, and would require staff time from either organization.

All other aspects of Alternative 4 would be the same as described in the Proposed Action.

Figure 5. Alternative 4 – Trails and Campgrounds



## Alternatives Considered but Dismissed

### *Allow bicycles on all constructed trails*

Constructing all sections of trail to accommodate bicycle and pedestrian use where possible was considered but dismissed from detailed analysis. The 1997 *Frontcountry DCP* process likewise considered and dismissed allowing bicycles on the trail along the Nenana River. An expansive system of bicycle trails would not be consistent with the desired conditions for a natural setting in Denali National Park and would conflict with the general approach to bicycles taken by the 2006 *NPS Management Policies* (NPS, 2006a). Under the 2006 *NPS Management Policies*, bicycle trails are to be established primarily as a means of providing alternatives to motorized transportation. The Proposed Action and Alternative 4 would provide this non-motorized transportation opportunity and meet the purpose and need of the project in a way that is more aligned with NPS policy. Therefore, allowing bicycles on all of trails proposed in the project was considered but dismissed from further analysis.

**Table 2. Summary of Alternatives**

Action	Alternative 1: No Action	Alternative 2: Construct Multiuse and Pedestrian Trails (Preferred Alternative)	Alternative 3: Wait for the Railroad Realignment	Alternative 4: Trails and Campgrounds
Multiuse Trail	None	8 miles	None if the railroad is not realigned to the west of the Parks Highway If the railroad is realigned, 8 miles of multiuse trail would be constructed, including 2 miles on the former railroad alignment	8 miles
Hiking Trail	None	9 miles	10 miles	9 miles
ABA Accessible Trail	None	2 miles	Before realignment – 1 mile After realignment – 2 miles	2.5 miles
Overlooks, Benches, and Interpretive Signs	None	Possible, concentrated near trailheads	Possible, concentrated near trailheads	Possible, concentrated near trailheads and campgrounds
Bridge Over Riley Creek	None	Multiuse bridge connecting to Riley Creek Day Use Area	Multiuse bridge connecting to Riley Creek Day Use Area	Multiuse bridge connecting to Riley Creek Day Use Area
Winter Use	No change, area available for off-trail day use	Trails available for day use, no grooming at present	Trails available for day use, no grooming at present	Trails available for day use, no grooming at present

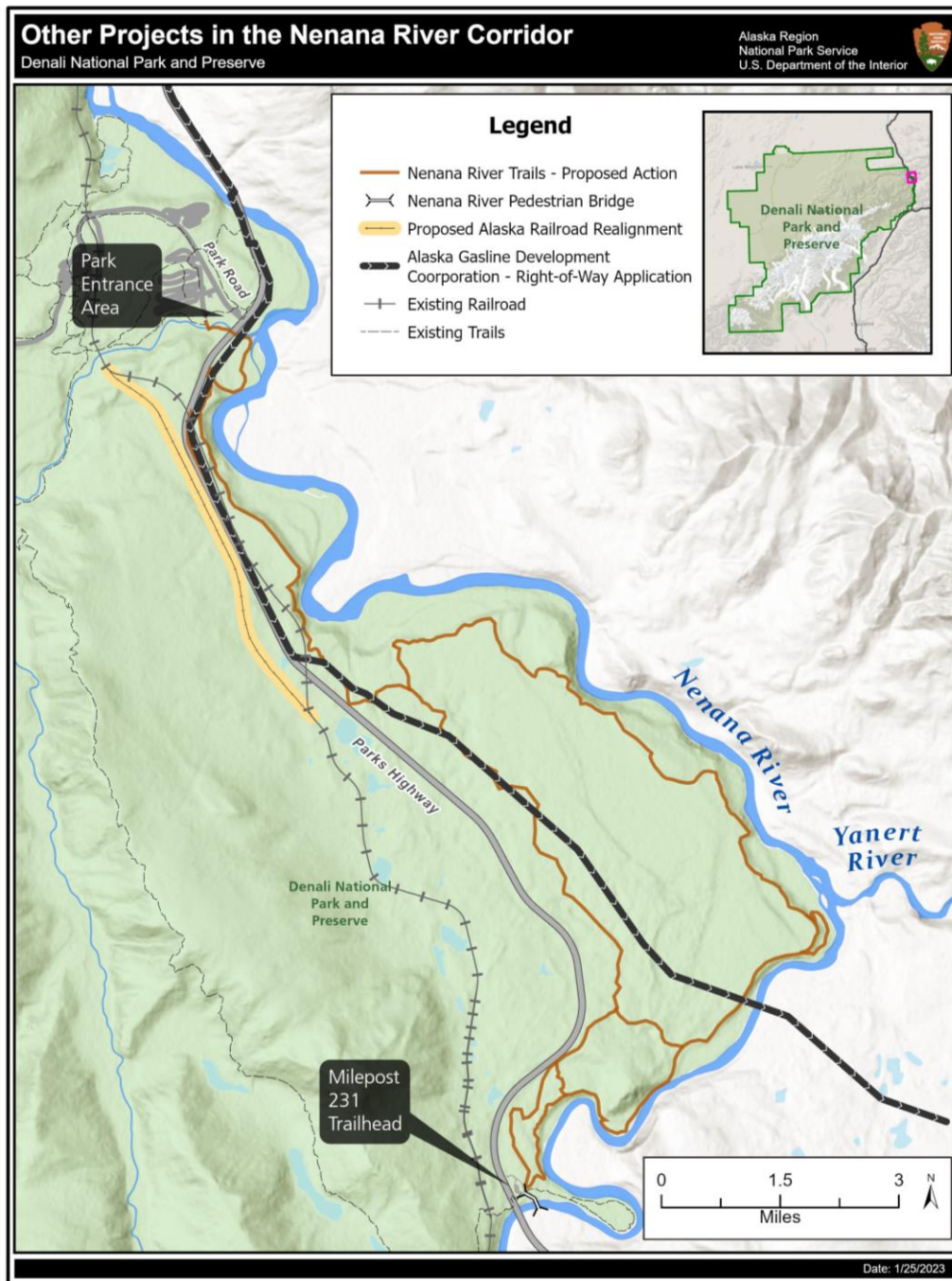
Action	Alternative 1: No Action	Alternative 2: Construct Multiuse and Pedestrian Trails (Preferred Alternative)	Alternative 3: Wait for the Railroad Realignment	Alternative 4: Trails and Campgrounds
Commercial Use	Managed according to existing guidance	Managed according to existing guidance	Managed according to existing guidance	Managed according to existing guidance
Campgrounds	None	None	None	Two walk-in campgrounds with 3-7 tent spaces each and associated facilities including cook shelters, food storage, and pit or composting toilets

## 6 Affected Environment & Environmental Consequences

The affected environment describes the existing condition of resources that could be impacted by implementing any of the alternatives. Resource impacts would result from the actions described in the alternatives as well as from other projects underway or planned for the Nenana River corridor. These other projects informed the planning of the proposed project and provide the context in which the Proposed Action and its environmental consequences would occur. These other projects in the Nenana River corridor include:

- A trailhead constructed in 2022 near mile 231 of the Parks Highway that serves the existing Oxbow and Triple Lakes trails and would serve any constructed trails
- A multiuse bridge crossing the Nenana River near mile 231 of the Parks Highway
- Development of multiuse separated pathways along the Parks Highway between Cantwell and Healy
- Development of a liquefied natural gas (LNG) pipeline through the Nenana River corridor
- Realignment of the Alaska Railroad to the west side of the Parks Highway between highway mile 234 and 236

**Figure 6. Other Past, Present, and Reasonably Foreseeable Future Projects in the Nenana River Corridor**



In 2022 the NPS in partnership with the Alaska DOT constructed a wayside and trailhead on NPS land near mile 231 of the Parks Highway. As described in the *2017 Milepost 231 Wayside EA*, this trailhead is intended to provide a safe parking area for visitors using the Triple Lakes or Oxbow trails (NPS, 2017). The trailhead provides parking for approximately 30 passenger vehicles and 12 longer vehicles such as buses, vehicles with trailers, or RVs. Any additional trails constructed in the Nenana River corridor would also connect to this trailhead.

The NPS plans to construct a bridge accommodating pedestrians and cyclists across the Nenana River in the vicinity of Parks Highway mile 231 and connecting to the mile 231 trailhead. The concept for a dedicated pedestrian crossing of the Nenana River in this area was proposed in the *2017 Milepost 231 Wayside EA*, but was not included in the final 2022 construction of the wayside (NPS, 2017). The bridge would connect the public boat launch area on the south side of the Nenana River to the NPS wayside and trailhead on the north side of the river near mile 231 of the Parks Highway. Construction of the bridge is expected in 2025 or 2026.

Recent planning efforts in the Denali Borough have demonstrated a desire from Borough residents for multiuse pathways along major roadways in the Borough, including the Parks Highway (Denali Borough, 2015; Denali Borough, 2018; Alaska DOT, 2022). The Denali Borough in partnership with the Alaska DOT has been actively seeking funding during 2021 and 2022 for the planning and construction of multiuse pathways along the Parks Highway from Cantwell to Healy. The *2022 Cantwell to Healy Planning and Environmental Linkages Study* outlines potential routes, costs, and environmental consequences from this system of multiuse pathways.

The Alaska Gasline Development Corporation (AGDC) has proposed construction of an approximately 800-mile LNG pipeline, a section of which would traverse approximately six miles of the Nenana River corridor. As proposed by AGDC, the section of the pipeline in Denali National Park would be mostly buried and would require an operation and maintenance corridor cleared of vegetation approximately 53.5 feet wide along its length within the park (Federal Energy Regulatory Commission, 2020). Although the NPS issued permit to AGDC in 2021 for eventual operation of the pipeline, no authorization for construction has been given and final route selection, engineering, and design are not yet complete as of early 2023. If front end engineering and design were to commence in 2023, it is possible that construction of the pipeline could begin around 2025-2030.

The Nenana River corridor includes approximately two miles of the Alaska Railroad between mile 234 (at-grade crossing) and mile 236 (above-grade crossing) of the Parks Highway. Realignment of this section of railroad to the west side of the Parks Highway has been proposed for a number of years (Alaska Railroad Corporation, 2018; Alaska DOT, 2022). Both the Alaska DOT and the Alaska Railroad Corporation have sought funding to begin the realignment, but as of early 2023 none has been awarded. The action alternatives in this EA consider how the possible realignment of the railroad in this section could affect trail development in the Nenana River corridor (see pg. 8-10).

Any environmental consequences or resource impacts from the Proposed Action and alternatives described in this EA would be in addition to the impacts from these other past, present, and reasonably foreseeable future projects in the Nenana River corridor. The totality of these impacts is analyzed in the cumulative impacts sections for each impact topic analyzed below.

## Wildlife

### ***Wildlife - Affected Environment***

The Nenana River corridor provides habitat for a wide variety of species including moose, caribou, black and grizzly bears, a diversity of migratory and resident avian species, pollinators including native bumblebees, and numerous medium and small mammals such as lynx, wolverine, ermine, snowshoe hare, coyote, red squirrels, voles, porcupines, and marten.

Some of the habitat in the Nenana River corridor is similar to that near the Denali Visitor Center, and moose in particular may use the Nenana River corridor in a way that is similar to their use of the visitor center area, including as a spring calving ground. The Nenana River corridor may provide excellent spring calving habitat for moose due to its abundance of food and cover and its current lack of human activity.

Spring moose calving likely draws bear activity to the Nenana River corridor. In the late summer and fall, patches of soapberries on the floodplains likewise provide an attractive food source that may increase bear activity in the Nenana River corridor. During other times of year, there is a general lack of concentrated high-quality food sources for bears, which may limit their activity in the area to movement through the Nenana River corridor rather than constant occupation. Because food sources are generally poor for bears during much of the year in the Nenana River corridor, subadult bears may get pushed into the area by older bears that dominate more food-rich areas. Both black and grizzly bears likely make use of the Nenana River corridor.

There are no documented wolf denning or rendezvous sites in the area.

The Nenana River corridor provides winter habitat for small groups of caribou originating to the east of the Nenana River corridor in the Yanert valley and surrounding area. These small groups move into and out of the Nenana River corridor during the winter and spring. The Denali caribou herd is not known to use the Nenana River corridor.

The steep, sandy bluffs overlooking the Nenana River provide excellent nesting and foraging habitat for a high diversity of insect pollinators, including native bees. This exposed sandy habitat type is not common in the area. To date, more than 40 species of bees have been documented in the bluffs above the Nenana River, representing 75% of all the bee species known in Denali National Park (Rykken, 2020). Sandy bluffs and dunes are a known hotspot for bee diversity in Interior and Arctic Alaska (Armbruster & Guinn, 1989).

At least 20 species of birds reside in the Nenana River corridor year-round, including Canada Jay, common raven, black-capped chickadee, and spruce grouse. A diversity of migratory birds including many species of waterfowl, shorebirds, raptors, and passerines nest in the area. The vernal ponds in the area are particularly important to migrating waterfowl and shorebirds that use them for feeding or resting during spring migration.

In general, the Nenana River valley and the confluence of the Nenana and Yanert rivers are likely a well-used travel route for many species of wildlife. The combination of surrounding terrain features

and existing human development may funnel wildlife onto available travel routes. Hunting pressure on moose and caribou in the upper reaches of the Yanert valley may push these species in particular down the Yanert River and into the Nenana River corridor.

### ***Wildlife - Environmental Consequences***

#### **1. Alternative 1 - No Action**

##### ***Direct and Indirect Impacts***

If no trails or other recreational infrastructure were built in the Nenana River corridor, wildlife would continue to use the area as they do at present. Without an increase in human activity on the landscape, there would be no increase in the potential for human-wildlife interaction, displacement of wildlife, or wildlife habituation. Wildlife habitat and movement patterns would not be affected by the construction and use of trails in the Nenana River corridor or changed from current conditions.

##### ***Cumulative Impacts***

If the NPS did not construct any trails or recreational infrastructure in the Nenana River corridor, wildlife would still be affected by other projects that have already taken place or are planned for the area. The NPS trailhead at mile 231 of the Parks Highway and the addition of a pedestrian bridge crossing the Nenana River to the trailhead could increase foot traffic on the existing Oxbow and Triple Lakes trails. If the Denali Borough and/or the Alaska DOT were to construct multiuse pathways along the Parks Highway, human use on the landscape would increase and would include additional bicycle activity, including through the Nenana River corridor.

The possible construction of new multiuse pathways and increased use of existing trails may increase the possibility of human-wildlife conflict, particularly with bears and moose. Bicycle use, with its higher speeds and low levels of human-generated noise, can be especially likely to result in surprise encounters between humans and wildlife. These human-wildlife interactions may cause some animals to leave the area entirely, while other animals may become tolerant of or conditioned to the increased human presence.

The construction of an LNG pipeline through the Nenana River corridor would fragment the habitat available to wildlife and would affect wildlife movement patterns by providing an easier travel route cleared of vegetation. The removal of vegetation in the LNG pipeline corridor could also deter some species from crossing the cleared area. The realignment of the Alaska Railroad to the west of the Parks Highway would likewise leave the former alignment within the Nenana River corridor as an attractive travel route or barrier for wildlife.

Overall, if the NPS took none of the actions described in this EA, wildlife in the Nenana River corridor would be impacted by other projects occurring or likely to occur in the area. These impacts include an increase in human-wildlife interactions and subsequent displacement or habituation of individual animals. Wildlife habitat in the area would also be disrupted by the possible LNG pipeline and railroad realignment, leading to changes in wildlife movement patterns.

## 2. Alternative 2 – Construct Multiuse and Hiking Trails (Proposed Action)

### *Direct and Indirect Impacts*

Development of hiking and multiuse trails in the Nenana River corridor would increase the presence of humans in the area and would increase human-wildlife interactions. These interactions would have different effects on different species but would generally lead to increased physiological stress on individual animals, displacement of individual animals from the area, and an increased potential for unsafe human-wildlife interactions.

Moose may be disturbed by human activity and individual moose would likely either move their activity to the 2,840 acres of the Nenana River corridor without trail development or would be displaced into other nearby areas with similar habitat. Some individual moose may become habituated to human presence and would continue to use the area as at present (Belant, Paynter, Stahlnecker, & Van Ballenberghe, 2006). If displacement caused moose to use less-optimal habitat for calving, it could make individual animals more vulnerable to mortality from disease and predation. During calving season, interactions between trail users and moose may be more likely to occur and more likely to be unsafe.

The increased presence of humans on the landscape under the Proposed Action would also increase the potential for interactions with bears. Surprise encounters with bears tend to be the most dangerous. Due to the fast speed and quiet operation of bicycles surprise encounters between bicyclists and bears are particularly likely. In addition to being potentially dangerous for trail users, these human-bear interactions would lead to physiological stress for individual bears.

If the Proposed Action were implemented, bears in the Nenana River corridor could become tolerant of human activity or could become conditioned to show an interest in humans. This would be an effect on individual bear behavior but could become a learned behavior for additional bears if sows with cubs become either tolerant or conditioned to human activity in the Nenana River corridor. The possibility for developing tolerant or conditioned bears in the area is lessened somewhat because bears most likely move through the area rather than spend a majority of their time there.

Small and abundant generalist or scavenging species such as Canada jays and red squirrels could be particularly affected by any litter or food left by trail users. These animals may be drawn to concentrations of human food, causing changes to movement patterns and possible health effects to individual animals.

The small groups of caribou which pass through the Nenana River corridor in the winter and spring may be displaced temporarily and locally following interactions with trail users. This would cause increased physiological stress on individual caribou.

Overall, human-wildlife interactions in the Nenana River corridor would increase due to the increased presence of humans on the landscape using the trails described in the Proposed Action. These interactions would be most likely to cause temporary displacement and increased physiological stress on individual animals (Anderson, Waller, & Thornton, 2023; Salvatori et al.,

2023). Some interactions may be unsafe, both for wildlife and trail users. The likelihood of an unsafe human-wildlife interaction is increased when wildlife is surprised. A surprise encounter is more likely with the fast speeds and relatively quiet operation of the bicycles that would be allowed on the multiuse trail. The effects of these human-wildlife interactions are expected to be confined to the animals in the Nenana River corridor, and are not anticipated to have larger effects to wildlife populations beyond the project area.

In addition to the increased possibility for human-wildlife interactions, the presence of trails may affect the way wildlife of all kinds move through and use the area. For smaller animal species which do not range over large areas such as bees, porcupines, marten, and red squirrels, the construction of trails could represent a decrease in the overall amount of available habitat in the immediate vicinity of the trails.

For other species like moose, bears, and caribou, the trails may act as the path of least resistance, and animals may be drawn to use them as travel corridors. This may increase the possibility for human-wildlife interactions. Alternatively, animals may be repelled by the human activity on the trails and may avoid using the trails or crossing them. This would fragment the amount of habitat in the area available to animals and may prevent some animals from accessing the Nenana River or other important habitat areas.

In general, the presence of trails in the Nenana River corridor may change the movement patterns of individual animals and may decrease the amount of habitat available for species with small ranges.

### *Cumulative Impacts*

If implemented, the Proposed Action would add to and exacerbate the wildlife impacts from the other projects described at the beginning of the Affected Environment section (pg. 18). Human presence on the existing Oxbow and Triple Lakes trails will likely increase due to the trailhead constructed in 2022 and the future pedestrian crossing of the Nenana River, leading to the increased potential for human-wildlife interactions. The construction of additional trails under the Proposed Action could draw still more people to the area and spread them over a greater area, further increasing the possibility for human-wildlife interactions.

Similarly, if the Alaska DOT were to construct multiuse pathways along the Parks Highway between Cantwell and Healy, there would likely be increased bicycle use along a greater portion of the Parks Highway, exacerbating the wildlife impacts in the Nenana River corridor from encountering bicyclists and further increasing the potential for unsafe human-wildlife interactions.

Construction of an LNG pipeline through the Nenana River corridor and/or realignment of the Alaska Railroad in the project area would further disturb wildlife. Each of these potential future projects would create paths cleared of vegetation that may encourage wildlife to use them or could discourage wildlife from crossing them, depending on the species and season. The addition of 17 miles of trail in the Proposed Action would fragment habitat and increase the extent of cleared paths in the area, increasing the degree to which wildlife movements are affected by these cleared areas.

Overall, the cumulative impact to wildlife from the Proposed Action when considered in concert with other past, present, and reasonably foreseeable future projects would be similar in nature to the direct and indirect impacts described above. However, these cumulative impacts would be greater in magnitude and geographic extent than the impacts from the Proposed Action considered alone. A greater number of individual animals would be more likely to encounter humans and experience the physiological stress from those interactions or be displaced from the area. Similarly, when considered together all of the possible projects in the area could have a greater effect on wildlife movement in the area, creating cleared corridors that wildlife may gravitate towards or may avoid. Still, these cumulative impacts are most likely to involve animals in the project area itself and are unlikely to affect wider wildlife populations in Denali National Park or the surrounding region due to the relative abundance of similar habitats in the surrounding region with a lesser degree of human influence.

### 3. Alternative 3 – Wait for the Railroad Realignment

#### *Direct and Indirect Impacts*

The wildlife impacts from implementation of Alternative 3 would in most ways mimic those of the Proposed Action described above. Under Alternative 3, construction of the multiuse trail would be contingent on the realignment of the Alaska Railroad to the west side of the Parks Highway through the project area. The primary differences between wildlife impacts under the Proposed Action and Alternative 3 therefore involve the extent to which the multiuse trail creates those impacts.

The extent and nature of human-wildlife interactions from the hiking trails would be the same under the Proposed Action and Alternative 3. If the multiuse trail were eventually constructed under Alternative 3, the impacts from that trail would also mirror those described for the Proposed Action.

However, if the railroad were not realigned and the multiuse trail were not constructed in Alternative 3, the likelihood of human-wildlife interactions would be decreased under Alternative 3 as compared to the Proposed Action. The NPS would not construct the eight miles of multiuse trail, and no bicycle use would be allowed. This would decrease the overall presence of humans on the landscape as compared to the Proposed Action, and would decrease the opportunity for trail users and wildlife to interact. Without bicycle use, there would be less likelihood of surprise encounters between humans and wildlife, especially moose and bears, and fewer encounters would be unsafe.

The extent to which wildlife movements are impacted by the multiuse trail would also differ between the Proposed Action and Alternative 3 if the railroad were not realigned and the multiuse trail were not constructed under Alternative 3. Without the railroad realignment, Alternative 3 would reduce the overall miles of trail constructed from 17 to nine, and would eliminate the eight-mile-long, eight-foot-wide multiuse trail altogether. This would represent a decrease in the amount of cleared corridor available to wildlife to either use as a path of least resistance when moving through the area or to avoid entirely. Wildlife movement patterns and access to habitat would therefore be less affected by implementation of Alternative 3 as compared to the Proposed Action.

Overall, the wildlife impacts from Alternative 3 would be very similar to those described in the Proposed Action. The main differences would be from the possible elimination of the multiuse trail under Alternative 3 if the Alaska Railroad were not realigned through the project area. In that case, the elimination of eight miles of trail and especially of bicycle use from the Nenana River corridor would decrease the possibility for human-wildlife interactions and the extent to which wildlife movements are affected by trails and trail use in the area. Similar to the Proposed Action, the effects of human-wildlife interactions and changes to wildlife movement under Alternative 3 are expected to be confined to the animals in the Nenana River corridor, and are not anticipated to have larger effects to wildlife populations beyond the project area.

#### *Cumulative Impacts*

The cumulative impacts to wildlife from Alternative 3 would be very similar to those described for the Proposed Action.

If the Alaska Railroad were not realigned through the project area and the NPS did not construct a multiuse trail through the Nenana River corridor (the primary difference between the Proposed Action and Alternative 3), it is likely that the DOT would construct a multiuse separated pathway along the Parks Highway in the project area eventually (Alaska DOT, 2022; Denali Borough, 2018). This separated pathway would likely be closer to the highway than the multiuse trail described in the Proposed Action. The wildlife impacts from Alternative 3 without a railroad realignment, when considered cumulatively with the possible future DOT-led construction of a multiuse pathway through the area, would therefore likely be somewhat less than but not substantially different from those of the Proposed Action. The key difference is that a separated pathway closer to the highway would likely have greater sight distances, reducing the potential for surprise human-wildlife interactions when compared to a multiuse pathway further away from the highway as described in the Proposed Action.

Overall, the cumulative impact to wildlife from Alternative 3 when considered with other past, present, and future projects would be similar to the cumulative impacts described for the Proposed Action, with a likely reduction in the possibility for human-wildlife interactions under Alternative 3 without the railroad realignment as compared to the Proposed Action.

#### 4. Alternative 4 – Trails and Campgrounds

##### *Direct and Indirect Impacts*

Impacts to wildlife from the presence and use of trails under Alternative 4 would be the same as described in the Proposed Action. However, there would be additional wildlife impacts under Alternative 4 due to the presence and use of two small campgrounds in addition to the trails.

Use of the campgrounds as described in Alternative 4 would increase the concentration of human activity on the landscape and add this concentrated, stationary human presence in the campgrounds to

the temporary, mobile visitor use of the trails. This longer-term and more concentrated use of the campgrounds would increase the possibility for human-wildlife interactions beyond the level described for the Proposed Action. The greater probability of human-wildlife interactions due to the campgrounds would create a greater probability and intensity of wildlife impacts, including physiological stress on individual animals, displacement of individual animals from the area, and an increased potential for unsafe human-wildlife interactions as compared to the Proposed Action.

Bears in particular could be drawn to concentrations of human food and food scents that would inevitably accumulate in campgrounds. Bears could become habituated to the presence of humans in the campgrounds, and could become conditioned to receiving human food in and around the campgrounds. Although the campgrounds would provide wildlife-safe food storage facilities, the potential for wildlife becoming conditioned to human food is greatly increased by the possibility of people storing food incorrectly. If bears became conditioned to receiving human food at the campgrounds, there would be a much greater likelihood of unsafe interactions between bears and humans under Alternative 4 than under the Proposed Action.

Smaller species, especially abundant generalist species like Canada jays and red squirrels would also be attracted to the concentrations of human food that would be probable in campgrounds. This would affect individual animals' behavior, movement through the area, and possibly individuals' physiological health. Porcupines in particular would be drawn to chew on any structures associated with the campgrounds such as cooking shelters or restroom facilities.

Wildlife movement through the area would be more greatly affected by Alternative 4 than under the Proposed Action as some animals would seek out the campgrounds to access food left by campground users and others would avoid the campground areas and the increased concentration of human activity they would support.

### *Cumulative Impacts*

The cumulative impacts to wildlife from Alternative 4 would be similar to those detailed for the Proposed Action but would also include the additional impacts described above due to the presence and use of campgrounds in Alternative 4.

These additional impacts beyond the Proposed Action include an increased probability of human-wildlife interactions, including unsafe interactions, an increased potential for wildlife habituation and conditioning to human food, and increased changes to wildlife movement through the area as species are either attracted to the concentrations of human food in campgrounds or avoid the increased concentration of human activity that the campgrounds would support.

Overall, the cumulative impact to wildlife from Alternative 4 when considered in concert with other past, present, and reasonably foreseeable future projects would be similar in nature to the direct and indirect impacts from Alternative 4 described above. These cumulative impacts would be greater in magnitude and geographic extent than the impacts from Alternative 4 when considered alone and would also be of greater magnitude than the cumulative impacts from the Proposed Action.

## **Vegetation and Wetlands**

### ***Vegetation and Wetlands – Affected Environment***

The vegetation community in the project area is primarily boreal forest. The dominant closed to open needle-leaf forest is comprised of white and/or black spruce with an understory of low dwarf birch and willow scrub as well as ericaceous plants such as lowbush blueberry and cranberry (Viereck et al., 1992). Integrated among the spruce are areas of deciduous or mixed spruce-deciduous dominated forest, with aspen, birch, and balsam poplar present.

This type of vegetation is common in the region, however, the glacial history and complex topographic setting of the Nenana River corridor is somewhat unusual. A mixture of flat benches, small esker ridges, and relict kettle ponds allow for a diversity of vegetation types at a scale such that traversing the area can bring one into contact with, for example, dense spruce forest, dry aspen groves, grassy meadows, and riparian willows, all within a relatively short period of time. This arrangement of vegetation is somewhat uncommon along the Park Road corridor and other areas of the park frequented by visitors.

Several wetland types are present among the more densely forested lands. Wetland delineation within the project area identified three non-navigable water and eight wetland National Wetland Inventory (NWI) classes (FGDC, 2013). The most common of these is the Palustrine Seasonally Saturated Needle-leaved Deciduous Scrub-Shrub (PSS4B) type (Ives & McNown, 2020). Other jurisdictional and functional wetlands in the project area are seasonally flooded or saturated and occupy small depressions or slope toes near the Nenana River. The wetlands associated with topographic depressions are mostly found interspersed among upland forest well above the Nenana River. They are generally independent of each other, without shared hydrologic connections.

Spruce bark beetles, among other forest insects and pathogens, are native to the Nenana River corridor and currently have a minor impact on the area's spruce forests, with small areas of damage apparent. However, it is possible that spruce bark beetle populations may reach outbreak population levels in the near future. Beginning in 2016, the Matanuska-Susitna area has experienced an outbreak of the native spruce bark beetle, causing near complete mortality of large diameter white spruce in affected areas. The infestation has travelled north with an active front currently directly adjacent to the project area. If it continues, a severe spruce bark beetle infestation would primarily affect white spruce in the project area, killing older and larger trees in particular. This would open the canopy, allowing younger spruce and other species such as aspen to take advantage of the increased access to sunlight. A less severe or patchy infestation could still lead to the loss of many of the largest spruce trees, reducing canopy cover and encouraging the growth of younger spruce and shrub species. The overall effect of spruce bark beetles on the Nenana River corridor will likely be to reduce the number of older, larger spruce trees and thereby shift the vegetation community to be more dominated by younger stands of spruce. It is possible, however, that a prolonged or major outbreak would kill a very large percentage of spruce trees in this area, possibly affecting the length of time for recovery due to reduced availability of seeds.

There are invasive plant species documented on the western edge of the Nenana River corridor, due largely to the influence of construction and travel along the Parks Highway. The invasive species of primary concern include white sweet clover (*Melilotus alba*) and bird vetch (*Vicia craca*). Although these species are present immediately adjacent to the Parks Highway, existing trails departing directly from the highway such as the Oxbow and Triple Lakes trails generally have not proven to be corridors of infestation for invasive plant species.

## ***Vegetation and Wetlands – Environmental Consequences***

### **1. Alternative 1 – No Action**

#### ***Direct and Indirect Impacts***

If no trails or other recreational infrastructure were constructed in the project area, there would be no change to the existing vegetation and wetlands. There would be no removal or disturbance of vegetation or wetland areas, there would be no anthropogenic vegetation composition change, and there would be no change to the extent of invasive species prevalence in the area.

#### ***Cumulative Impacts***

If the NPS were to take no action in the Nenana River corridor, there would be no direct or indirect effects on the vegetation and wetland communities in the area. However, ongoing trends independent of NPS action such as the native spruce bark beetle infestation would continue to affect the area. The primary impact of spruce bark beetles on the Nenana River corridor would be to kill larger and older spruce trees, allowing for a more open canopy and a vegetation shift toward younger spruce trees and other species such as aspen that would thrive in a more open forest.

Additionally, other projects in the Nenana River corridor would likely still proceed, whether or not the NPS takes the actions described in this EA. These projects include construction of a pedestrian bridge over the Nenana River near mile 231 of the Parks Highway, construction of separated pathways along the Parks Highway, construction of an LNG pipeline, and realignment of the Alaska Railroad in the Nenana River corridor. Several of these projects, particularly construction of separated pathways and an LNG pipeline through the Nenana River corridor would involve the removal of vegetation and disturbance to wetlands, whether or not the NPS takes the actions described in this EA. Because these actions would remove and disturb vegetation, they would also increase the possibility for vegetation composition change and the spread of invasive plant species in the Nenana River corridor whether or not the NPS takes any of the actions described in this EA.

### **2. Alternative 2 – Construct Multiuse and Hiking Trails (Proposed Action)**

#### ***Direct and Indirect Impacts***

Constructing 17 miles of trail would remove approximately 11 acres of vegetation out of the approximately 2,850 acres in the Nenana River corridor. Approximately 0.85 acres of wetlands

would be crossed by the trails. Most of these wetland areas would be crossed by boardwalks and would not be filled to create a trail surface. Boardwalks, either planks run between sills placed on the surface or supported by helical piles driven into the ground, minimize impacts to wetland functioning. In total, approximately 0.6 acres of wetlands would be filled or disturbed under the Proposed Action.

Vegetation clearing to create trails would disturb the landscape and introduce the possibility for vegetation composition change along the trail corridors. Disturbed areas such as those adjacent to trail corridors tend to allow establishment of aspen, willows, and invasive species. It is possible that after construction, the vegetation along the edges of the trails would change to an assemblage of these species rather than the vegetation community dominated by spruce and ericaceous plants that dominates at present. This would represent a long-term but very localized change in vegetation composition along the margins of the trails.

If implemented, construction of 17 miles of trail under the Proposed Action could facilitate the spread of invasive species in the Nenana River corridor. Foot and/or bicycle traffic on the trails could spread invasive species along the trails. This potential is exacerbated by the close proximity of the Parks Highway, the southern access to the trails directly from the highway, and the known invasive species issues along the Parks Highway. Currently, the existing Oxbow and Triple Lakes trails are accessed directly from the highway, and neither trail has a substantial issue with invasive species. Although the potential exists for the Proposed Action to further spread invasive plant species, the likelihood of a problem developing is relatively low.

### *Cumulative Impacts*

If implemented, the Proposed Action would add to the vegetation and wetlands impacts anticipated from other ongoing issues and past, present, or reasonably foreseeable projects in the area.

In total, the Proposed Action would remove approximately 11 acres of vegetation to construct trails. This would be in addition to the approximately 2.5 acres of vegetation removed for the 2022 construction of a trailhead near mile 231 of the Parks highway and the approximately 36 acres of vegetation in the area that would be disturbed if the LNG pipeline were constructed through the area. Similarly, the 0.6 acres of wetlands disturbed under the Proposed Action would be in addition to the amount of wetlands affected by these other projects.

Spruce bark beetles will affect the Nenana River corridor whether or not the NPS implements the Proposed Action. However, it is possible that vegetation removal activities associated with the Proposed Action, particularly the cutting of spruce trees, may exacerbate the likelihood of bark beetle attack at the tree and stand scale. Because beetles can be attracted by tree stress signals, cut trees may support a greater intensity of beetle activity. The subsequent mortality of large spruce trees by the spruce bark beetles may introduce vegetation composition change. Under the Proposed Action, this spruce bark beetle-driven composition change would be in addition to the vegetation changes immediately adjacent to the trails stemming from the disturbance from trail construction. The overall

effect could be a greater portion of the project area with a more open canopy, fostering the growth of younger spruce trees as well as species that thrive in a more open forest.

Many of the other projects that have already taken place in the Nenana River corridor or may take place in the future also have the potential to increase the spread of invasive species. The known invasive plant species along the Parks Highway could increase their spread in the area due to the increased visitor access provided by the trailhead at mile 231 of the highway, the pedestrian bridge across the Nenana River and connecting to the trailhead, any separated pathways constructed in the area, and the vegetation disturbance caused by the construction of an LNG pipeline through the area. The Proposed Action would add to these potential impacts by further increasing the amount of visitor access in the Nenana River corridor and by increasing the amount of disturbed vegetation vulnerable to invasive species by 11 acres. It is possible that severe reductions in the forest canopy closure that could result from spruce bark beetle-induced mortality could result in greater risk of invasive plant species spread in the area.

Overall, implementation of the Proposed Action would add to and exacerbate the vegetation and wetlands impacts that can be anticipated from other past, present, and reasonably foreseeable actions and issues affecting the Nenana River corridor. The nature of these impacts would remain the same whether or not the Proposed Action were implemented, but the geographic extent of the vegetation and wetlands impacts would increase with implementation of the Proposed Action.

### 3. Alternative 3 – Wait for the Railroad Realignment

#### *Direct and Indirect Impacts*

The direct and indirect vegetation and wetlands effects from Alternative 3 would in most ways mirror those of the Proposed Action. The differences in impacts between the two alternatives would arise if the railroad were not realigned and the multiuse trail were not constructed under Alternative 3.

In this case, the overall amount of vegetation and wetlands impacts would be reduced by the extent to which the multiuse trail contributes to those impacts. As compared to the Proposed Action, the overall amount of vegetation removal would be approximately four acres under Alternative 3 as opposed to 11 in the Proposed Action. Similarly, the amount of wetlands crossed by the trails would be reduced to 0.17 acres. The amount of wetlands filled in to create a trail surface would likewise decrease from 0.6 acres to 0.23 acres without a multiuse trail.

The extent of vegetation composition change along trail corridors would likewise decrease in Alternative 3 without multiuse trail construction when compared to the Proposed Action. If the railroad were not realigned and if the multiuse trail were not constructed under Alternative 3, there would be approximately eight fewer miles of trail and therefore less extensive vegetation change at trail margins. Eight fewer miles of trail would also reduce the extent of the Nenana River corridor that would be susceptible to invasive species transport along the trails.

Under Alternative 3, if the railroad were not realigned the multiuse trail would not be constructed and the impacts to vegetation and wetlands would be reduced by the extent to which the multiuse trail contributes to those impacts. If the railroad were realigned and the multiuse trail were constructed on the former railroad alignment, the vegetation and wetland impacts would be the same as those of the Proposed Action.

#### *Cumulative Impacts*

The cumulative vegetation and wetlands effects from Alternative 3 would in most ways mirror those of the Proposed Action.

Even if the railroad were not realigned and the NPS did not construct a multiuse trail under Alternative 3, it is likely that the Denali Borough would continue to seek funding for a system of separated pathways along the Parks Highway, including in the Nenana River corridor. A separated pathway in the Nenana River corridor would be located within the Parks Highway right of way and would likely be paved, with most wetland areas crossed by the pathway filled (Alaska DOT, 2022; Denali Borough, 2018). This would result in a greater degree of vegetation and wetlands impact compared to the Proposed Action.

Overall, if the railroad were realigned and a multiuse trail were constructed under Alternative 3, the cumulative wetlands and vegetation impacts from Alternative 3 would be the same as those from the Proposed Action. If the railroad were not realigned and no multiuse trail were constructed under Alternative 3, the cumulative vegetation and wetlands impacts from Alternative 3 would likely be greater than those of the Proposed Action, as a wider, paved multiuse trail would likely be constructed eventually in the Parks Highway right of way, requiring a greater amount of vegetation removal and wetlands disturbance.

#### 4. Alternative 4 – Trails and Campgrounds

##### *Direct and Indirect Impacts*

The direct and indirect vegetation and wetlands impacts from Alternative 4 would mirror those of the Proposed Action, with additional impacts anticipated from the establishment of campgrounds under Alternative 4.

In addition to the vegetation and wetlands impacts described for the Proposed Action (pg. 29), Alternative 4 would add approximately six acres of vegetation disturbance for the establishment of two small campgrounds. In total, Alternative 4 would require the removal of approximately 17 acres of vegetation. Although the campgrounds themselves would disturb approximately six acres of vegetation, they would be established on uplands, and would not entail additional wetlands disturbance beyond that described for the Proposed Action.

Because Alternative 4 would require additional vegetation removal beyond the Proposed Action, the possibility for vegetation composition change adjacent to disturbed areas and the possibility for invasive species establishment is also increased under Alternative 4.

Additionally, because visitors would spend extended amounts of time in the campgrounds, the possibility for the creation of social trails is increased under Alternative 4. If created, these social trails could further remove vegetation, disturb wetlands, lead to vegetation composition change, and increase the spread of invasive species surrounding campground areas. Social trails exist in areas surrounding current Denali National Park campgrounds, and although vegetation disturbance has been noted in these areas, issues with invasive species have not yet emerged.

### *Cumulative Impacts*

The cumulative impacts from Alternative 4 would be the same as for the Proposed Action, with the addition of direct and indirect impacts described for Alternative 4 above.

Those additional vegetation and wetlands impacts center on the additional six acres that would be developed for campgrounds under Alternative 4. These additional six acres would add to the vegetation removal, vegetation composition change, and potential for invasive species spread described as cumulative impacts for the Proposed Action (pg. 30).

Overall, the cumulative impact to vegetation and wetlands from Alternative 4 when considered in concert with other past, present, and reasonably foreseeable future projects would be similar in nature to the direct and indirect impacts from Alternative 4 described above. These cumulative impacts would be greater in magnitude and geographic extent than the direct impacts from Alternative 4 when considered alone and would also be of slightly greater magnitude than the cumulative impacts from the Proposed Action.

## **Cultural Resources**

### ***Cultural Resources – Affected Environment***

The region surrounding the Nenana River corridor contains some of the most important cultural sites in central Alaska that provide evidence of some of the earliest human occupation of the New World as well as cultural continuity over the last 10,000 years. Of note there are multiple sites from the America Paleoarctic Tradition (dating to 10,600-7,000 years ago) along the Nenana River outside of the project area including Owl Ridge, Panguingue Creek, Carlo Creek, and the Erodaway Site. Additional sites dating to the Nenana Complex, Denali Complex, Northern Archaic Tradition, and Athapaskan Period are also found in close proximity to the project area. The presence of native place names in the project area also provides evidence of the long and rich cultural history of the area.

The more recent historic period of the area is also rich and is evidenced by the 18 recorded historic sites in the project area. There are an additional five cultural resource sites within the project area that may be historic in age, but further research is needed before that determination can be made. The

historic sites include cabin sites, those associated with railroad construction and use, mining, road construction, trapping, hunting, exploration, and park development.

## ***Cultural Resources – Environmental Consequences***

### ***1. Alternative 1 - No Action***

#### ***Direct and Indirect Impacts***

If no trails or other recreational infrastructure were built in the Nenana River corridor, cultural resources would exist as they do at present. Without an increase in human activity on the landscape, there would be no increase in the potential impacts to known cultural sites. Existing and previously undocumented cultural resources would not be potentially affected by the construction and use of trails in the Nenana River corridor or changed from current conditions.

#### ***Cumulative Impacts***

If the NPS did not construct any trails or recreational infrastructure in the Nenana River corridor, cultural resources could be affected by other projects that have already taken place or are planned for the area.

The possible DOT or Denali Borough construction of new separated pathways and increased use of existing trails from the trailhead and bridge at mile 231 of the Parks Highway may increase the possibility of cultural site disturbance.

The construction of an LNG pipeline is an adverse effect to cultural resources in the project area, although there are no known sites that would be impacted in the section that goes through the project area in the Nenana River corridor.

Overall, if the NPS took none of the actions described in this EA, cultural resources in the Nenana River corridor would be minimally impacted by other projects occurring or likely to occur in the area due to an overall increase in human presence in the area.

### ***2. Alternative 2 – Construct Multiuse and Hiking Trails (Proposed Action)***

#### ***Direct and Indirect Impacts***

Development of hiking and multiuse trails in the Nenana River corridor would increase the presence of humans in the area and would increase the potential for disturbance of known or previously undocumented cultural resource sites. Construction of the trails, borrow pits, and associated infrastructure would be completed in such a way to avoid cultural resources and so should minimally impact these resources.

Proposed trail alignments that would impact any of the above sites, or other sites that may be discovered during trail construction would be rerouted to avoid disturbing the sites. Reroutes would

be surveyed prior to trail construction and any cultural resources avoided through additional small realignments. Borrow pit locations would also be surveyed prior to construction and moved if any cultural resources are found within their footprints.

Given the rich cultural history of the area and the presence of historic era sites within the project area, periodic monitoring of ground disturbance would be conducted during construction under the Proposed Action, especially in sections of the proposed trails where cultural sites have been located or in areas that have high potential for buried cultural remains.

If cultural resources or items protected by the Native American Graves Protection and Repatriation Act were discovered during project implementation, all project-related activities in the vicinity of the discovery would be stopped and the park archaeologist would be notified immediately. The NPS in consultation with the State Historic Preservation Officer and other consulting parties would determine a course of action.

### *Cumulative Impacts*

If implemented, the Proposed Action would likely increase the potential for disturbance of cultural sites in the area beyond the increased potential presented by other projects that have taken place or are planned for the area. The construction of additional trails under the Proposed Action could draw still more people to the area and spread them over a greater area, increasing the possibility for cultural resource impacts.

Overall, the cumulative impact to cultural resources from the Proposed Action when considered in concert with other past, present, and reasonably foreseeable future projects would be similar in nature to the direct and indirect impacts from the Proposed Action described above.

## 3. Alternative 3 – Wait for the Railroad Realignment

### *Direct and Indirect Impacts*

The cultural resource impacts from implementation of Alternative 3 would in most ways mimic those of the Proposed Action described above. If Alternative 3 were implemented the multiuse trail route on the current railroad alignment would be surveyed prior to construction of that section of trail; if additional cultural resources are located during this or other surveys the trail routes would be moved to avoid impacts.

The extent and nature of cultural resource impacts from the hiking trails would be the same under the Proposed Action and Alternative 3. If the multiuse trail were eventually constructed under Alternative 3, the impacts from that trail would also mirror those described for the Proposed Action.

However, if the railroad were not realigned and the multiuse trail were not constructed in Alternative 3, the potential for cultural resources impacts would be decreased under Alternative 3 as compared to the Proposed Action. The NPS would not construct the eight miles of multiuse trail, and no bicycle

use would be allowed. This would decrease the overall presence of humans on the landscape as compared to the Proposed Action, and would decrease the opportunity for trail users to disturb cultural resources.

Overall, the cultural resource impacts from Alternative 3 would be very similar to those described in the Proposed Action. The main differences would be from the possible elimination of the multiuse trail under Alternative 3 if the Alaska Railroad were not realigned through the project area. In that case, the elimination of eight miles of trail would decrease the possibility of cultural resource impacts by trails and trail use in the area.

#### *Cumulative Impacts*

The cumulative impacts to cultural Resources from Alternative 3 would be very similar to those described for the Proposed Action.

If the Alaska Railroad were not realigned through the project area and the NPS did not construct a multiuse trail through the Nenana River corridor (the primary difference between the Proposed Action and Alternative 3), it is likely that the DOT would construct a multiuse separated pathway along the Parks Highway in the project area eventually through previously disturbed ground (Alaska DOT, 2022; Denali Borough, 2018). This separated pathway would likely be closer to the highway than the multiuse trail described in the Proposed Action. The cultural resource impacts from Alternative 3 without a railroad realignment, when considered cumulatively with the possible future DOT-led construction of a multiuse pathway through the area, would therefore likely be somewhat less than but not substantially different from those of the Proposed Action. The key difference is that a separated pathway closer to the highway would result in less exposure of cultural resources to visitor use and a lesser possibility of disturbance.

Overall, the cumulative impact to cultural resources from Alternative 3 when considered with other past, present, and future projects would be similar to the cumulative impacts described for the Proposed Action, with a likely reduction in the possibility for cultural resource impacts under Alternative 3 without the railroad realignment as compared to the Proposed Action.

#### 4. Alternative 4 – Trails and Campgrounds

##### *Direct and Indirect Impacts*

Impacts to cultural resources from the presence and use of trails under Alternative 4 would be the same as described in the Proposed Action. However, the presence and use of two small campgrounds in Alternative 4 would increase the possibility for cultural resource impacts due to an increase in the overall amount of human activity on the landscape under Alternative 4.

Use of the campgrounds as described in Alternative 4 would increase the concentration of human activity on the landscape and would add this concentrated, stationary human presence in the campgrounds to the temporary, mobile visitor use of the trails. This longer-term and more

concentrated use of the campgrounds would increase the possibility for and intensity of cultural resource disturbance beyond the level described for the Proposed Action as campground users may explore off-trail areas surrounding campgrounds that contain cultural resources. The proposed location of the campground near the Yanert River confluence in particular would create an increased possibility of disturbance to known cabin sites close to its location.

### *Cumulative Impacts*

The cumulative impacts to cultural resources from Alternative 4 would be similar to but slightly greater than those detailed for the Proposed Action due to the presence and use of campgrounds in Alternative 4. These additional impacts beyond the cumulative impacts described for the Proposed Action include an increased probability of cultural resource impacts due to increased visitor presence and duration of visits to the area.

Overall, the cumulative impact to cultural resources from Alternative 4 when considered in concert with other past, present, and reasonably foreseeable future projects would be slightly greater in nature to the direct and indirect impacts from Alternative 4 described above. These cumulative impacts would be greater in magnitude and geographic extent than the impacts from Alternative 4 when considered alone and would also be of greater magnitude than the cumulative impacts from the Proposed Action.

## **Recreation Resources and Visitor Experience**

### ***Recreation Resources and Visitor Experience – Affected Environment***

As of early 2023, the Nenana River corridor does not have much recreational infrastructure or visitor use. At the very southern end of the area, the trailhead near mile 231 of the Parks Highway can accommodate approximately 30 passenger vehicles and 12 longer vehicles such as buses, vehicles with trailers, or RVs. This trailhead serves the existing Oxbow and Triple Lakes trails. The very northern end of the Nenana River corridor terminates at the park entrance area, which has numerous developed trails, campgrounds, roads, and other visitor facilities. Barring those exceptions at the periphery of the Nenana River corridor, the remaining 2,850 acres is in a largely natural state without developed infrastructure. As such, the Nenana River corridor does not have much visitor use, with sporadic off-trail hiking in the area and no bicycle use beyond the Parks Highway shoulder. The section of the Nenana River bordering the project area is a popular float trip, and some river users may stop on NPS land. These stops are typically temporary, sporadic, and largely confined to the river's edge. Overall, the current level of infrastructure development and human presence in the Nenana River corridor is quite low.

There are approximately 40 miles of NPS-maintained developed trail throughout the 6 million acres of Denali National Park. The majority of these trails are concentrated in the non-wilderness, frontcountry area near the park entrance. Beyond these 40 miles of existing trail Denali National Park

is largely trail-less, with the approximately 99% of the park not considered frontcountry generally following a “no formal trails” policy (NPS, 2006b; NPS, 1986).

The only trails in the park currently open to bicycle use are the Roadside Bike Trail and the Parks Highway Multiuse Trail. Together, these trails connect the Denali Visitor Center to the business area on the Parks Highway just north of the Park Road entrance. Despite a desire to improve multimodal connections between the park entrance area and other surrounding residential and commercial areas, these trails remain the only link dedicated to providing such access (NPS, 2018; Alaska DOT, 2022; Denali Borough, 2018). Pedestrians and bicyclists approaching the park entrance area from the south use the Parks Highway shoulder immediately adjacent to vehicular traffic moving at 55 to 65 miles per hour.

### ***Recreation Resources and Visitor Experience – Environmental Consequences***

#### ***1. Alternative 1 – No Action***

##### ***Direct and Indirect Impacts***

If the NPS were to take no action in the Nenana River corridor, there would be no change in the recreation resources or visitor experiences that the area offers. Without the addition of recreational infrastructure, the level of development in the area and subsequent visitor use would not change. There would be no trails added to the overall total at Denali National Park and anticipated increases in visitor numbers would be accommodated on existing park trails. Pedestrian and bicycle access to the park would remain unchanged.

##### ***Cumulative Impacts***

The 2022 addition of the trailhead near mile 231 of the Parks Highway, a future pedestrian bridge crossing the Nenana in the same area, and possible future construction of separated pathways along the Parks Highway would introduce additional recreational infrastructure in and around the Nenana River corridor and would increase human presence on the landscape. These impacts would occur regardless of the NPS actions analyzed in this EA but would impact a lesser geographic area.

If the NPS did not construct a multiuse pathway in the Nenana River corridor, it is likely that a separated pathway adjacent to the Parks Highway in the area would eventually be constructed instead. This separated pathway would create an additional six miles of developed trail available to visitors within Denali National Park. This separated pathway would also provide multimodal connections from commercial and residential areas to the park, however, the separated pathway would be adjacent to the Parks Highway along the entire pathway length, and would provide a visitor experience less influenced by the natural landscape than the multiuse trail proposed in this EA.

## 2. Alternative 2 – Construct Multiuse and Hiking Trails (Proposed Action)

### *Direct and Indirect Impacts*

If the NPS were to implement the Proposed Action, approximately 17 miles of trail would be added to the recreational infrastructure in the Nenana River corridor. These new trails would connect with the trailhead near mile 231 of the Parks Highway as well as the existing Oxbow trail, Triple Lakes trail, and Riley Creek day use area. Use of this larger network of trails and other facilities in the area would increase the overall levels of human presence in the Nenana River corridor and would spread that visitor use over a greater geographic extent into areas that otherwise have very little human presence on the landscape.

The Proposed Action would also add 17 miles of developed trail to the existing 40 miles available in Denali National Park. Similar to the majority of existing trails, the 17 miles of trail in the Proposed Action would be developed in a frontcountry, non-wilderness area of the park. Although the trails themselves would only disturb approximately 11 acres of land, the trails would weave through an area of approximately 2,850 acres. Construction of the trails in the Proposed Action would effectively increase the total amount of trails available to visitors to 57 miles from the current 40 miles and would decrease the approximately six million acres of trail-less park land by 2,850 acres, representing less than 0.05% of the park's total acreage.

The eight miles of multiuse trail in the Proposed Action would facilitate multimodal connections between the park entrance area and residential and commercial areas to the south of the park entrance. The multiuse trail would also provide pedestrians and bicyclists a safer and more scenic alternative to the Parks Highway shoulder for transportation between the park entrance and areas to the south.

### *Cumulative Impacts*

When considered with other past, present, and reasonably foreseeable actions in the Nenana River corridor, the cumulative effect of implementing the Proposed Action would be to increase recreational infrastructure in the area and increase the level of human presence on the landscape. The trailhead near mile 231 of the Parks Highway and the bridge over the Nenana River in the same area would connect with the trails described in the Proposed Action and create a larger network of trails with the existing Oxbow and Triple Lakes trails. Together, this infrastructure would change the Nenana River corridor from an area with little developed recreational infrastructure and low levels of visitor use to an area characterized by trails and other recreational infrastructure. This increased level of development would likely encourage a greater level of visitor use than the area currently supports and would change the Nenana River corridor into a visitor destination.

With implementation of the Proposed Action, it is unlikely that an additional separated pathway would be constructed in the Nenana River corridor. As such, the cumulative impact to the amount of trail developed in Denali National Park would be the same as the direct and indirect impacts described above for the Proposed Action – 17 miles of trail would be added to the existing 40 miles of trail in Denali National Park. Similarly, without construction of a separated pathway the

cumulative impact to multimodal connections to the park would be the same as described above in the direct and indirect impacts – the multiuse trail in the Proposed Action would facilitate non-motorized transportation to the park entrance from areas to the south.

### 3. Alternative 3 – Wait for the Railroad Realignment

#### *Direct and Indirect Impacts*

The direct and indirect impacts to recreation resources and visitor experience from Alternative 3 would in most ways mirror those of the Proposed Action. The differences in impacts between the two alternatives would arise if the railroad were not realigned and the multiuse trail were not constructed under Alternative 3.

Similar to the Proposed Action, if the railroad were not realigned and Alternative 3 were implemented, the extent of recreational infrastructure and human use in the Nenana River corridor would increase. However, because Alternative 3 would not include the multiuse trail if the railroad were not realigned, these changes would be somewhat less than under the Proposed Action. Alternative 3 would only add 10 miles of trail to the existing 40 in Denali National Park as opposed to the additional 17 miles of trail in the Proposed Action. Alternative 3 would still introduce a greater degree of human activity on the landscape above current levels, but would limit that activity to one hiking trail.

Because Alternative 3 would not include a multiuse trail if the railroad were not realigned, Alternative 3 would not directly provide the multimodal connections to the park entrance area that the Proposed Action would. Pedestrians could use the 10 miles of hiking trail near the Nenana River to access the park entrance area, but bicyclists would continue to have the Parks Highway shoulder as their only transport option in the Nenana River corridor under Alternative 3.

#### *Cumulative Impacts*

The cumulative recreation resources and visitor experience effects from Alternative 3 would in most ways mirror those of the Proposed Action.

Even if the railroad were not realigned and the NPS did not construct a multiuse trail under Alternative 3, it is likely that the Denali Borough would continue to seek funding for a system of separated pathways along the Parks Highway, including in the Nenana River corridor. This separated pathway would provide the same approximate length of trail open to bicycles in the Nenana River corridor as the Proposed Action, would likely introduce the same type and intensity of human presence on the landscape, and would provide the same multimodal connections to the park entrance as the Proposed Action.

In contrast to the multiuse trail considered in the Proposed Action, this potential future separated pathway would be located within the Parks Highway right of way and would likely be paved (Alaska DOT, 2022; Denali Borough, 2018). This would provide a different visitor experience from that of

the multiuse trail under the Proposed Action. The separated pathway that would likely be constructed instead of the multiuse trail under Alternative 3 would be immediately adjacent to a highway and would provide an experience far less embedded in the natural landscape than would the multiuse trail under the Proposed Action.

#### 4. Alternative 4 – Trails and Campgrounds

##### *Direct and Indirect Impacts*

The direct and indirect impacts to recreation resources and visitor experience from Alternative 4 would be similar to those of the Proposed Action, but would also include effects from two small campgrounds in addition to the trails considered in the Proposed Action.

The addition of two small campgrounds to the 17 miles of trail considered in the Proposed Action would increase the overall level of recreational infrastructure in the Nenana River corridor. In addition to trails, Alternative 4 would include two small campgrounds with three to seven tent pads each, as well as associated facilities such as cooking shelters, food storage lockers, water catchment systems, and pit or composting toilets. These additional facilities would further increase the human footprint in the Nenana River corridor, and would increase the level of human activity in the area.

The nature of that human activity would also differ between the Proposed Action and Alternative 4. In addition to trail use, Alternative 4 would also support camping in the Nenana River corridor. This stationary, overnight human presence in the Nenana River corridor would be in addition to the transient, day-use-only activity on the trails. Alternative 4 would therefore introduce both a greater overall level of human activity on the landscape and would also change the nature of that use from mobile day-use only travel on trails to including overnight use of campgrounds as well.

Alternative 4 would add two small campgrounds as well as 17 miles of trail to the existing 40 miles of trail in Denali National Park. These campgrounds would be pedestrian access only, located approximately three miles from the closest trailhead. This type of hike-in campground camping would be a new addition to the developed recreational opportunities offered at Denali National Park, as nothing similar currently exists in the park.

The multimodal connections provided by Alternative 4 would be the same as those under the Proposed Action.

##### *Cumulative Impacts*

The cumulative effects from Alternative 4 would be the same as under the Proposed Action, with the additional effects from two small campgrounds. Overall, the level of developed infrastructure and human presence on the landscape would increase under Alternative 4. The trailhead near mile 231 of the Parks Highway and the bridge over the Nenana River in the same area would connect with the trails described in the Proposed Action and create a larger network of trails with the existing Oxbow and Triple Lakes trails. Under Alternative 4, two small campgrounds would be located along the

trails, adding to the level of development in the area and further increasing the amount and duration of human presence in the Nenana River corridor. Together, all of this infrastructure would change the Nenana River corridor from an area with little developed recreational infrastructure and low levels of visitor use to an area characterized by trails and campgrounds. This increased level of development would likely encourage a greater level of visitor use and would change the Nenana River corridor into a visitor destination. The degree of this change would be greater under Alternative 4 than under the Proposed Action.

With implementation of the Alternative 4, it is unlikely that an additional separated pathway would be constructed in the Nenana River corridor. As such, the cumulative impact to the extent of developed trails in Denali National Park would be the same as the direct and indirect impacts described above for Alternative 4 and for the Proposed Action – 17 miles of trail would be added to the existing 40 miles of trail in Denali National Park. In addition to these trails, Alternative 4 would include two small campgrounds. These hike-in campgrounds would provide a new visitor opportunity that does not currently exist in Denali National Park and would further increase the level of developed recreational facilities in the park.

The cumulative effects on multimodal connections under Alternative 4 would be the same as under the Proposed Action – the eight-mile multiuse trail would provide a dedicated connection to the park entrance through the Nenana River corridor for both pedestrians and cyclists. This non-motorized connection would interface with the trailhead near mile 231 of the Parks Highway, would tie into the pedestrian bridge over the Nenana River in the same area, and would fulfill the desire for a multiuse pathway in the area expressed in several other planning documents (Alaska DOT, 2022; Denali Borough, 2015; Denali Borough, 2018).

**Table 3. Summary of Impacts**

<b>Issue</b>	<b>Alternative 1: No Action</b>	<b>Alternative 2: Construct Multiuse and Hiking Trails (Proposed Action and Preferred Alternative)</b>	<b>Alternative 3: Wait for the Realignment</b>	<b>Alternative 4: Campgrounds and Trails</b>
<b><u>Wildlife:</u></b> Human-wildlife interactions	No change to the potential for human-wildlife interactions.	Increased potential for human-wildlife interactions from use of the trails.	<u>Before Realignment:</u> Same as Proposed Action except no multiuse trail or bicycle use, less opportunity for surprise human- wildlife interactions. <u>After Realignment:</u> Same as Proposed Action.	Same as Proposed Action with a greater likelihood of human- wildlife interactions due to concentrations of human food at the campgrounds and the possibility of wildlife becoming conditioned to receiving human food.
<b><u>Wildlife:</u></b> Habitat and movement patterns	No change to wildlife movement patterns.	Wildlife may be attracted to the trails as travel corridors or may avoid the trails due to human presence. Trails may fragment existing habitat or prevent wildlife access to habitat.	<u>Before Realignment:</u> Same as Proposed Action but to a lesser degree due to no multiuse trail. <u>After Realignment:</u> Same as Proposed Action.	Same as Proposed Action with greater impacts to wildlife movement due to the longer-term, more stationary visitor use of the campgrounds and the attraction or avoidance that wildlife may exhibit to that type of use.
<b><u>Vegetation and Wetlands:</u></b> Removal and disturbance	No vegetation removal or wetlands disturbance.	11 acres of vegetation removal. 0.85 acres of wetlands crossed by trails. 0.6 acres of wetlands disturbed.	<u>Before Realignment:</u> 4 acres of vegetation removal. 0.17 acres of wetlands crossed by trails. 0.23 acres of wetlands disturbed. <u>After Realignment:</u> Same as Proposed Action.	Same as Proposed Action, but with 6 additional acres of vegetation removal for establishment of campgrounds and an increased possibility for social trail development near campgrounds.
<b><u>Vegetation and Wetlands:</u></b> Composition change	No direct influence on vegetation composition change.	Vegetation composition change immediately adjacent to 17 miles of trail as the disturbed ground favors particular species.	<u>Before Realignment:</u> Same as Proposed Action but along only 10 miles of trail. <u>After Realignment:</u> Same as Proposed Action, less two miles of multiuse trail on the former railroad alignment.	Same as Proposed Action, with additional vegetation composition change within and around the campgrounds.

<b>Issue</b>	<b>Alternative 1: No Action</b>	<b>Alternative 2: Construct Multiuse and Hiking Trails (Proposed Action and Preferred Alternative)</b>	<b>Alternative 3: Wait for the Realignment</b>	<b>Alternative 4: Campgrounds and Trails</b>
<b><u>Vegetation and Wetlands:</u></b> Invasive species	No change in the probability of invasive species spread.	Increased possibility for invasive species spread along 17 miles of trail.	<u>Before Realignment:</u> Same as Proposed Action but only along 10 miles of trail. <u>After Realignment:</u> Same as Proposed Action.	Same as Proposed Action, with additional possibility for invasive species spread in and around the campgrounds.
<b><u>Cultural Resources:</u></b> Visitor disturbance	No change.	Increased potential for cultural resource disturbance from use of the trails.	<u>Before Realignment:</u> Same as Proposed Action but only along 10 miles of trail. <u>After Realignment:</u> Same as Proposed Action.	Increased potential for cultural resource disturbance from use of the trails as well as two small campgrounds.
<b><u>Recreation Resources and Visitor Experience:</u></b> Development in undeveloped area	No change to the level of development or visitor use in the area.	Change in Nenana River corridor from a largely undeveloped area to a visitor destination supporting trails and visitor use of the trails.	<u>Before Realignment:</u> Same as Proposed Action except no multiuse trail or bicycle use. <u>After Realignment:</u> Same as Proposed Action.	Change in Nenana River corridor from a largely undeveloped area to a visitor destination supporting trails and campgrounds and visitor use of these facilities.
<b><u>Recreation Resources and Visitor Experience:</u></b> Miles of trail vs. trail-less area	No additional construction of trails or loss of trail-less area in the park.	17 miles of trail added to the existing 40 miles across the park. Loss of approximately 2,850 acres of trail- less terrain of the 6 million acres in the park.	<u>Before Realignment:</u> 10 miles of trail added to the existing 40 miles across the park. <u>After Realignment:</u> Same as Proposed Action.	17 miles of trail added to the existing 40 miles across the park. Two small hike-in campgrounds provide a novel visitor experience. Loss of approximately 2,850 acres of trail-less terrain of the 6 million acres in the park.
<b><u>Recreation Resources and Visitor Experience:</u></b> Multimodal connectivity	No increase in multimodal connectivity, pedestrians and cyclists continue to use Parks Highway shoulder.	Multiuse trail for dedicated pedestrian and bicycle connection to the park entrance from trailhead at mile 231 of the Parks Highway.	<u>Before Realignment:</u> No increase in multimodal connectivity, pedestrians and cyclists continue to use Parks Highway shoulder. <u>After Realignment:</u> Same as Proposed Action.	Multiuse trail for dedicated pedestrian and bicycle connection to the park entrance from trailhead at mile 231 of the Parks Highway.

## 7 Consultation and Coordination

### Agencies and Organizations

Alaska Department of Natural Resources, Office of History and Archaeology  
Alaska Department of Transportation and Public Facilities  
Denali Borough  
Environmental Protection Agency  
United States Army Corps of Engineers

### National Park Service

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Leah Schofield, Alaska Region Environmental Coordinator  
Sarah Stehn, Denali National Park Botanist  
Jared Zimmerman, Denali National Park Trail Crew Lead

## 8 References

- Alaska Department of Transportation and Public Facilities. (2022). *Cantwell to Healy – Parks Highway Milepost 203-259 Planning and Environmental Linkages (PEL) Study*. Retrieved from <https://dot.alaska.gov/nreg/parkshealypel/>
- Alaska Railroad Corporation. (2018). *Denali Park Realignment (MP 344-348) Feasibility Study*. Retrieved from <https://www.alaskarailroad.com/corporate/projects>

- Anderson, A.K., Waller, J.S., & Thronton, D.H. (2023). Partial COVID-19 closure of a national park reveals negative influence of low-impact recreation on wildlife spatiotemporal ecology. *Nature Scientific Reports*, 13:687.
- Armbruster, W.S. & Guinn, D.A. (1989). The solitary bee fauna (Hymenoptera: Apoidea) of interior and Arctic Alaska: flower associations, habitat use, and phenology. *Journal of the Kansas Entomological Society*, 62, 468-483.
- Belant, J.L., Paynter, J.A., Stahlnecker, K.E., & Van Ballenberghe, V. (2006). Moose distribution relative to human development in a national park. *Alces*, 42:33-39.
- Denali Borough. (2018). *Denali Borough Land Use and Economic Development Plan*. Retrieved from [https://www.denaliborough.org/land\\_management](https://www.denaliborough.org/land_management)
- Denali Borough. (2015). *Denali Borough Comprehensive Plan*. Retrieved from <https://www.denaliborough.org/planning>
- Federal Energy Regulatory Commission. (2020). *Alaska LNG Project Final Environmental Impact Statement*. FERC Docket No. CP17-178-000. Retrieved from <https://ferc.gov/industries-data/natural-gas/environment/final-environmental-impact-statement-feis>
- Federal Geographic Data Committee (FGDC). (2013). *Classification of Wetlands and Deepwater Habitats of the United States*. Second Edition. Wetlands Subcommittee, Federal Geographic Data Committee and U.S. Fish and Wildlife Service, Washington, DC. (FGDCSTD-004-2013).
- Ives, S. L. & R. W. McNown. (2020). *Nenana River Trails Wetland Delineation: Report to the National Park Service from ABR, Inc. - Environmental Research & Services*. Unpublished report.
- National Park Service. (1986). *Denali National Park and Preserve General Management Plan*. Retrieved from <https://irma.nps.gov/DataStore/Reference/Profile/605774>
- National Park Service. (1997). *Denali National Park and Preserve Entrance Area and Road Corridor Development Concept Plan* (GPO Publication No. 1997-843-305).
- National Park Service. (2006a). *2006 Management Policies*. (GPO Publication No. 0-16-076874-8).
- National Park Service. (2006b). *Denali National Park and Preserve Final Backcountry Management Plan*. Retrieved from <https://irma.nps.gov/DataStore/Reference/Profile/654189>
- National Park Service. (2012). *Denali Park Road Final Vehicle Management Plan and Environmental Impact Statement*. Retrieved from <https://irma.nps.gov/DataStore/Reference/Profile/2259344>
- National Park Service. (2017). *Milepost 231 Wayside and Trail Connections Environmental Assessment*. Retrieved from <https://parkplanning.nps.gov/projectHome.cfm?projectID=59087>

- National Park Service. (2018). *Denali National Park and Preserve Long Range Transportation Plan*. Retrieved from <https://parkplanning.nps.gov/projectHome.cfm?parkID=9&projectID=49953>
- National Park Service. (2020). *Denali National Park and Preserve Winter and Shoulder Season Visitor Services Environmental Assessment*. Retrieved from <https://parkplanning.nps.gov/projectHome.cfm?projectID=94730>
- Rykken, J. (2020). [Pollinator habitat and diversity on Nenana River bluffs]. Unpublished raw data.
- Salvatori M., Oberosler, V., Rinaldi, M. et al. (2023). Crowded mountains: Long-term effects of human outdoor recreation on a community of wildlife mammals monitored with systematic camera trapping. *Ambio*, <https://doi.org/10.1007/s13280-022-01825-w>
- Viereck, L. A., C. T. Dyrness, A. R. Batten, & K. J. Wenzlick. (1992). *The Alaska Vegetation Classification*. U.S. Department of Agriculture Forest Service, Pacific Northwest Research Station, Portland, OR. (General Technical Report PNW-GTR-286)

## Appendix A: ANILCA Section 810(A) Subsistence – 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 subsistence activities which could result from constructing trails and other recreational facilities in the Nenana River corridor area of Denali National Park between the George Parks Highway and the Nenana River.

### II. The Evaluation Process

Section 810(a) states:

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

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

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

"The park additions and preserve shall be managed for the following purposes, among others: To protect and interpret the entire mountain massif, and additional scenic mountain peaks and formations; and to protect habitat for, and populations of, fish and wildlife, including, but not limited to, brown/grizzly bears, moose, caribou, Dall sheep, wolves, swans and other waterfowl; and to provide continued opportunities, including reasonable access, for mountain climbing, mountaineering, and other wilderness recreational activities."

ANILCA Section 202(3) also states: "Subsistence uses by local residents shall be permitted in the additions to the park where such uses are traditional in accordance with the provisions in Title VIII.

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

*"... to preserve unrivaled scenic and geological values associated with natural landscapes; to provide for the maintenance of sound populations of, and habitat for, wildlife species of inestimable value to the citizens of Alaska and the Nation, including those species dependent on vast relatively undeveloped areas; to preserve in their natural state extensive unaltered arctic tundra, boreal forest, and coastal rainforest ecosystems to protect the resources related to subsistence needs; to protect and preserve historic and archeological sites, rivers, and lands, and to preserve wilderness resource values and related recreational opportunities including but not limited to hiking, canoeing, fishing, and sport hunting, within large arctic and subarctic wildlands and on free-flowing rivers; and to maintain opportunities for scientific research and undisturbed ecosystems.*

*"... consistent with management of fish and wildlife in accordance with recognized scientific principles and the purposes for which each conservation system unit is established, designated, or expanded by or pursuant to this Act, to provide the opportunity for rural residents engaged in a subsistence way of life to continue to do so."*

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

### **III. Proposed Action on Federal Lands**

#### **A. Alternative 1 – No Action**

Under the No Action alternative, no trails, overlooks, signs, bridges, or other facilities would be constructed in the project area. The area would remain open for off-trail day use throughout the year. No formalized winter trails or recreational opportunities would be created. Potential commercial use of the area would be evaluated and managed under existing laws, NPS policies, park planning documents, and park compliance and commercial services processes.

#### **B. Alternative 2 – Construct Multiuse and Hiking Trails**

##### **(Proposed Action and Preferred Alternative)**

Approximately 17 miles of trail would be constructed in the Nenana River corridor. Of this total, approximately eight miles would be a multiuse trail open to both pedestrians and bicyclists. This trail would be approximately eight feet wide and would primarily have a crushed gravel surface. The remaining approximately nine miles of trail would be open to pedestrians only and would be approximately one to two feet wide with a primarily natural surface. The southernmost approximately one mile of hiking trail would be constructed to provide a two-mile Architectural Barriers Act (ABA) universally accessible loop when combined with the southernmost mile of the multiuse trail.

A bridge accommodating both bicycles and pedestrians would cross Riley Creek and connect the trails to the Riley Creek day use area.

In addition to wayfinding signage on the trails, there may be other facilities constructed along the trails, including benches, interpretive signs, or overlook areas. These additional facilities would be concentrated near trailheads.

No other facilities would be constructed on or near the trails under the proposed action.

### **C. Alternative 3 – Wait for the Railroad Realignment**

Alternative 3 would mirror the Proposed Action except with respect to the multiuse trail.

Under Alternative 3, no section of the multiuse trail would be constructed unless the Alaska Railroad is rerouted to the west side of the Parks Highway from approximately highway mile 234 to 236.

If the railroad were realigned to the west side of the Parks Highway, the multiuse trail would be constructed under Alternative 3. The multiuse trail would be the same as described in the Proposed Action except for the approximately two-mile section between Parks Highway mile 234 and 236. In this two-mile section, instead of crossing the Alaska Railroad and making use of the DOT right of way, the multiuse trail would use the former railroad alignment.

If the railroad were not realigned, no section of the multiuse trail would be constructed under Alternative 3.

### **D. Alternative 4 – Campgrounds and Trails**

Alternative 4 would be the same as the Proposed Action but would add two small walk-in campgrounds to the trail system.

One campground would be located just to the east of the former gravel pit near mile 234 of the Parks Highway and one campground would be located in the vicinity of the confluence of the Nenana River and the Yanert Fork of the Nenana. It could be possible to provide ABA access and ABA-compliant facilities in the campground near milepost 234. This would require an additional approximately 0.25-mile trail to access the campground from the trail network described in the Proposed Action.

Both campgrounds would be rustic and provide three to seven tent pads each. Additional facilities associated with the campgrounds would include cooking shelters with or without picnic tables, wildlife safe food storage lockers, water catchment systems as needed, and pit or composting toilets. Campgrounds would potentially require reservations and/or user fees and would not be available for use during winter months. The intent of the campgrounds would be to provide a visitor experience that is distinct from camping in a drive-up campground and from the trailless backpacking otherwise offered in Denali.

All other aspects of Alternative 4 would be the same as described in the Proposed Action.

All alternatives are described in more detail in the environmental assessment (EA). Customary and traditional subsistence use on NPS lands will continue as authorized by federal law under all alternatives. Federal regulations implement a subsistence priority for rural residents of Alaska under Title VIII of ANILCA.

## **IV. Affected Environment**

Subsistence uses within Denali National Park and Preserve are permitted in accordance with Titles II and VIII of ANILCA. Section 202(3)(a) of ANILCA allows local residents to engage in subsistence uses, where such uses are traditional in accordance with the provisions in Title VIII. Lands within former Mount McKinley National Park are closed to subsistence uses.

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

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

Primary subsistence species, by edible weight, are moose, caribou, furbearers, and fish. Varieties of subsistence fish include coho, king, pink, and sockeye salmon. Dolly Varden, grayling, lake trout, northern pike, rainbow trout and whitefish are also among the variety of fish used by local people. Beaver, coyote, land otter, weasel, lynx, marten, mink, muskrat, red fox, wolf, and wolverine are important furbearer resources. Shed (discarded) animal parts and plants are collected and used for subsistence purposes. Rock and willow ptarmigan, grouse, ducks, and geese are important subsistence wildlife resources. Wild berries are also commonly harvested for subsistence use near the project site.

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

All actions analyzed in the EA including the Proposed Action take place in the former Mount McKinley National Park, which is closed to subsistence use.

## **V. Subsistence Uses and Needs Evaluation**

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

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

#### **A. The potential to reduce populations:**

Provisions of ANILCA and Federal and State regulations provide protection for fish and wildlife populations within Denali National Park and Preserve.

All the proposed actions and alternatives to the proposed actions take place within the former Mount McKinley National Park, which is closed to subsistence use. Although some components of the proposed action may adversely affect individual moose, caribou, or members of other wildlife species, the wildlife effects of the proposed action are not anticipated to reduce overall wildlife populations.

#### **B. Restriction of Access:**

Section 811 of ANILCA addresses “Access” for subsistence as follows: “The Secretary shall ensure that rural residents engaged in subsistence uses shall have reasonable access to subsistence resources on public lands.” The proposed alternatives all involve the former Mount McKinley National Park which is closed to subsistence use. As such, none of the alternatives are expected to significantly restrict traditional subsistence use patterns or access on federal public lands within the region.

#### **C. Increase in Competition:**

The proposed alternatives are not expected to significantly increase competition for subsistence resources on federal public lands within the region, and the proposed alternatives do not restrict in any way the taking of subsistence resources or allow other users to take subsistence resources. Provisions of ANILCA and NPS regulations mandate that when it is necessary to restrict the taking of fish or wildlife, subsistence users will have priority over other user groups.

### **VI. Availability of Other Lands**

The proposed project is site-specific to lands within Denali National Park and Preserve, because the proposed actions involve visitor facilities within the park. It is determined that no other federally managed lands would be suitable for this project. The proposed action is consistent with the mandates of ANILCA, including Title VIII, and the NPS Organic Act.

### **VII. Alternatives Considered**

Four alternatives were analyzed for this project and are described in detail in the Environmental Assessment. All of the alternatives occur within the same area of Denali National Park, where Title VIII subsistence uses are not authorized. None of the alternatives proposed would significantly restrict subsistence uses on other adjacent federally managed lands.

### **VIII. Findings**

This analysis concludes that the proposed action and considered alternatives will not result in a significant restriction of subsistence uses.

## Appendix B: Wetlands and Floodplains Statement of Findings

### Introduction

Executive Order (EO) 11990, *Protection of Wetlands* and EO 11988, *Floodplain Management*, require the National Park Service (NPS) and other federal agencies to evaluate the likely impacts of action in wetlands and floodplains, respectively. NPS Director's Order 77-1: Wetland Protection and Procedural Manual 77-1 provide NPS policies and procedures for complying with EO 11990. NPS Director's Order 77-2: Floodplain Management and Procedural Manual 77-2 provide NPS policies and procedures for complying with EO 11988.

This Statement of Findings (SOF) has been prepared to comply with EO 11990 and 11988. The NPS has prepared an Environmental Assessment (EA) for the proposed construction of trails within Denali National Park and Preserve (Denali). In the EA, the NPS identified the construction of multiuse and hiking trails as the preferred alternative.

The purpose of this SOF is to present the rationale for the proposed trail construction in wetland and floodplain areas and to document the anticipated effects on these resources.

### Summary of Proposed Action

The Proposed Action would create a total of approximately 17 miles of trail. Approximately 8 miles would be a Class IV multiuse trail designed for safe concurrent use by bicyclists and pedestrians. The multiuse trail would be approximately eight feet wide and would have a primarily crushed gravel surface.

An additional approximately nine miles of trail in the project area would be open to pedestrians only. These hiking trails would be Class II, approximately one to two feet wide with a primarily natural surface.

The southernmost mile of the hiking trails would be an accessible loop from the Mile 231 trailhead in conjunction with the southernmost mile of the multiuse trail. This mile of accessible pedestrians-only trail would be approximately 5 feet wide and would have a crushed gravel surface.

Boardwalks would be used to cross wetland areas. On trails where only hiking is allowed, these boardwalks would be planks running between supports placed on top of the ground surface. For the multiuse trail, the boardwalk would be suspended above the wetland surface by helical piles driven into the ground.

In addition to wayfinding signage on the trails, there may be other facilities constructed along the trails, including benches, interpretive signs, or overlook areas. These additional facilities would be concentrated near trailheads.

An approximately 8-foot-wide bridge allowing for safe concurrent use by pedestrians and cyclists would cross Riley Creek and connect the trail system to the Riley Creek day use area on the northern end of the

project area. The bridge could be constructed as a single span of 250' or as two 125' segments. One 125' span would be sufficient to cross the stream channel, while a second 125' span would improve accessibility and keep the trail out of the floodplain on the north side of Riley Creek.

Ice jams on Riley Creek occasionally occur from freeze up to break-up, and evidence of ice pushing up and damaging trees is evident along upstream stretches of the creek's banks. An overall bridge span of 250', in either one or two segments, would allow for water, ice, and debris to flow under the bridge during flood events. The bridge structure would also be located well above the 100-year flood level to minimize the potential for damage from moving ice floes and debris.

Each bridge span would be a prefabricated steel truss or similar design. If possible, the Riley Creek bridge would share design elements with the planned pedestrian crossing of the Nenana River at mile 231 to provide an iconic and consistent visitor experience.

Concrete abutments or driven piles would support the bridge. If two 125' spans were used, the concrete pier between the two segments would be located out of the stream channel.

## **Site Description**

Denali National Park and Preserve encompasses approximately 6 million acres spanning the central Alaska Range. The project area is on the very northeastern margin of the park, a strip of land between the Parks Highway and the Nenana River. The uplands in this area of the park are dominated by a closed to open boreal forest with low dwarf birch, willow scrub, ericaceous plants. Scrub shrub, slope wetlands are located on benches, swales, and at toeslopes. Depressional kettle formations, some of which contain wetlands, are scattered throughout the study area.

The Nenana River forms the eastern boundary of the park and of the project area, and the northern end of the proposed trails would cross Riley Creek. There are currently no trails or other infrastructure in the project area, however, a trailhead and wayside was constructed at the southern end of the project area to serve two nearby existing trails.

## **Wetland Delineation**

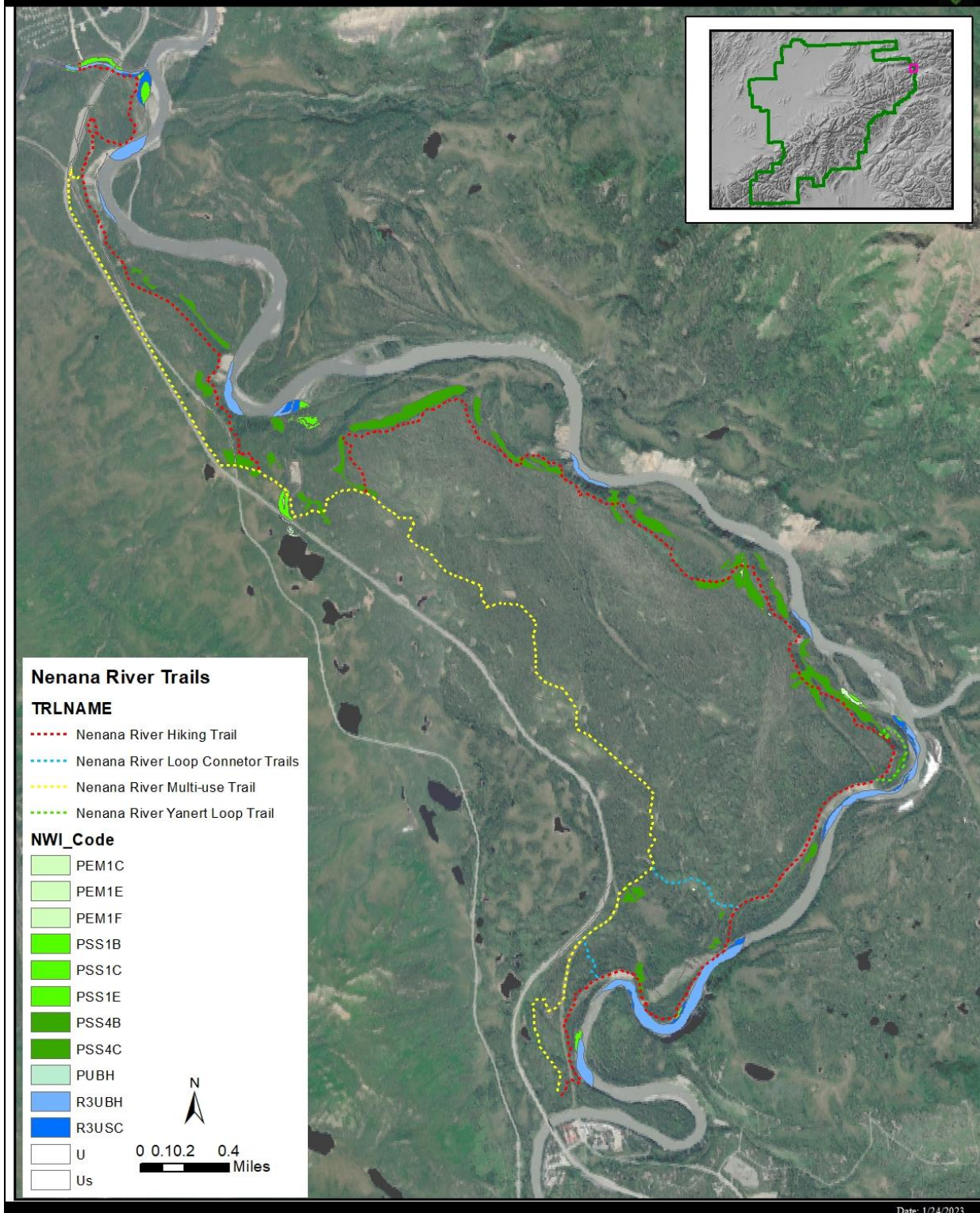
Some of the wetlands in the project area were delineated in conjunction with a proposed natural gas pipeline that would utilize a granted right-of-way within the park. A 2018 Vegetation and Wetland report presents the findings of the baseline (current existing conditions) field data collected in 2018 to include the vegetation cover and extent of Waters of the U.S. within the 258-acre DENA Alternative Project study area (DENA study area). The Waters of the U.S.(WOUS) included wetlands, ponds, streams, and rivers. Field data was collected in 2018 by Michael Baker International (Michael Baker) from July 17 through July 19, 2018.

The collected field data were used in conjunction with topographical base maps, aerial photography, and other data sources. Michael Baker verifies the evaluation and collection of field data, wetland determinations, and the resulting digital maps and figures were performed in accordance with guidance provided in the U.S. Corps of Engineers (USACE) Wetland Delineation 1987 Manual (USACE 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region, 2007 Supplement Version 2.0 [2007 Supplement] (USACE 2007). All field data analysis was reported using the 2016 National Wetlands Plant List (Lichvar et al. 2016).

In 2020, the park contracted ABR Inc. to conduct a wetland delineation on the proposed Nenana Trail project area, supplementing the coverage from the 2018 study. Field surveys were conducted 6 to 9 July 2020 by ABR wetlands scientists Susan Ives (Professional Wetland Scientist, PWS #2623) and Robert McNown in accordance with NPS Procedural Manual #77-1. Routine wetland determinations were performed following the USACE three-parameter approach (Environmental Laboratory 1987, USACE 2007), and wetlands and waters in the study area were classified per the Classification of Wetlands and Deepwater Habitats of the United States, Second Edition (FGDC 2013).

Thirteen National Wetland Inventory (NWI) classes (FGDC 2013) were identified in the study area: three non-navigable waters, eight wetlands, and two non-wetlands (uplands). Palustrine Seasonally Saturated Needle-leaved Deciduous Scrub-Shrub (PSS4B) was the most commonly mapped wetland type in the study area. PSS4B wetlands were typically dwarf black spruce (*Picea mariana*) woodlands on level to gently sloping terrain on terraces above the Nenana River, with thick surface organic layers and saturated soils. Wetlands were also documented in association with rivers, streams, and ponds.

The park made some modifications to the preferred trail alignments that placed some trails just outside of the ABR survey area. During the summer of 2022, park staff trained in wetland delineation and identification of wetland plants conducted supplemental field investigations to quantify those areas that may be impacted by the project. The field crew expanded the polygons mapped by ABR strictly from the mapped characteristic vegetation assemblages but did not conduct any further soil investigation. This likely overestimates wetland area.



## Functional Wetland Assessment

The operational draft Guidebook for Reference Based Assessment of the Functions of Precipitation-Driven Wetlands on Discontinuous Permafrost in Interior Alaska (Alaska DEC 1999) was used to complete a

functional assessment of the wetlands and surface waters within the study area. For all of the wetland function discussions, it is assumed that existing wetlands are currently in reference condition, have not been disturbed by any significant direct activity, and are high-functioning.

### ***Hydrologic Functions***

#### **Soil Profile Integrity**

This function represents the presence of intact horizons within the soil profile. Soil profiles characteristic of precipitation-driven wetlands on discontinuous permafrost in Interior Alaska have organic horizons and deep silty or loamy mantles.

Where trail treatment consists of sills and boardwalks, only the sills would disturb soil profiles. Trails consisting of gravel fill or a combination of fill and geotextiles would completely remove the organic, loamy soil layers. The total soil disturbance of the trail system would be 0.22 acres. The total area of wetlands in the project corridors (wetland polygons crossed by the trails) is 64.2 acres. The expected reduction in soil profile integrity is 0.3%.

#### **Characteristic Soil Thermal Regime**

This function represents the capacity of the wetland to maintain or return to the characteristic soil thermal conditions of Interior Alaska within a period of time determined by climate and landscape position. Low soil temperatures and permafrost soils often characterize late seral stages of precipitation-driven wetlands on discontinuous permafrost in Interior Alaska.

Where trail treatment consists of sills and boardwalks, only the sills would disturb soil profiles. Trails consisting of gravel fill or a combination of fill and geotextiles would completely remove the insulating soil layers. The total area of wetlands in the project corridors (wetland polygons crossed by the trails) is 64.2 acres. The total soil disturbance of the trail system would be 0.22 acres, but the disturbance to the thermal regime would be greater.

Arp and Simmons (2014) conducted a study of ORV trails in Wrangell-St. Elias National Park and Preserve and found the thermal disturbance to be greatest directly on the trails, but relatively modest under the vegetated trail edge. This was a short-term study, but the observed impacts from permafrost degradation beyond the trail prism were not extensive. If we assume thermal impacts to be twice the area of soil removal (0.44 acres), the expected reduction in soil thermal regime is 0.6%. Because this area is in a zone of discontinuous permafrost, these impacts are likely to be an overestimate.

#### **Surface and Near-Surface Water Storage**

This function represents the capability of a wetland to temporarily store (retain) surface and shallow subsurface water. Precipitation-driven wetlands on discontinuous permafrost in Interior Alaska characteristically store surface and near-surface water within surface relief features, organic soil horizons, and silty or loamy mineral horizons.

Most of the wetlands in the area consists of sloping wetlands with some shallow depressions. The trail routing has been selected specifically to avoid low-lying areas whenever possible. Where they cannot be

avoided, these areas will be elevated boardwalks on helical piers. None of the trail treatments would cause increased drainage of low-lying ponds or increase flow through sloping wetlands.

Where trail treatment consists of sills and boardwalks, only the sills would disturb soil profiles and reduce water storage capacity. Trails consisting of gravel fill or a combination of fill and geotextiles would completely remove the organic, loamy soil layers. The total soil disturbance of the trail system would be 0.22 acres. The total area of wetlands in the project corridors (wetland polygons crossed by the trails) is 64.2 acres. The expected reduction in surface and near-surface water storage is 0.3%.

### ***Biogeochemical Functions***

#### **Cycling of Elements and Compounds**

This function represents short- and long-term transformation of elements and compounds through abiotic and biotic processes that convert chemical species (e.g., nutrients and metals) from one form, or valence, to another. Elemental transformations are a function of the redox environment and are reversible (i.e., cyclical) processes.

This function depends on both the wetland vegetation and soil profile, so would be reduced along all trail types except for those sections of elevated boardwalk. The total disturbed wetland area is 0.42 acres and total wetland area is 64.2 acres. The expected reduction in biochemical cycling is 0.7%.

#### **Organic Carbon Export from Sedge Tussock Wetlands**

This function represents export of dissolved and particulate organic carbon (OC) from Sedge Tussock wetlands. Export mechanisms include leaching, displacement, and erosion.

Wetlands in the project area are isolated and not connected to surface streams or broadly conducive to export of organic carbon. No reduction in this function is expected as the result of this project.

### ***Plant Community***

#### **Characteristic Plant Community**

This function represents the species composition and physical characteristics of living plants typically found in precipitation-driven wetlands. The emphasis is on the dynamics and structure of the plant communities as evidenced by the presence of trees, shrubs, herbs, mosses, lichens, and liverworts, and by the physical characteristics of the vegetation.

Woody vegetation would be removed along the alignment of all trail types. Other vegetation types would be adversely impacted by all trail types except for those sections of elevated boardwalk. The total disturbed wetland area is 0.42 acres and total wetland area is 64.2 acres. The expected reduction in characteristic plant community is 0.7%.

## ***Faunal Support/Habitat***

### Faunal Support/Habitat Components

This function represents the capacity of a wetland to support animal populations and guilds by providing heterogeneous habitats.

The proposed project does not significantly reduce the diversity or quantity of habitats available to animal populations.

### Interspersion and Connectivity

This function represents characteristic juxtaposition and contiguous corridors of native plant communities necessary to meet life history requirements of organisms, including movements to and from the wetland.

The proposed project does not significantly reduce movements to and from the wetlands impacted by the trails.

## **Minimization**

Based on the presence of wetlands, several of the trail alignments were changed to minimize wetland disturbance. This was done both to protect the wetlands and to improve sustainability of the trails. In relatively flat-lying areas of the trail where the wetlands could not be avoided, the park will use helical piers supporting an elevated boardwalk to minimize adverse impacts. The trail segments where elevated boardwalks will be used were not included in the calculations of total impacted wetlands. The park is considering additional minor trail adjustments to further reduce wetland impacts but must have those areas surveyed for cultural resources beforehand.

## **Impacts to Wetlands**

The trails segments that are elevated at least 24 inches above grade on helical piers are assumed to cause no adverse impacts to the wetlands or wetland function. The area under the elevated walks totals 0.23 acres and compensatory mitigation for this area is not required.

Segments that are boardwalks supported by horizontal sills cause direct soil impacts where the sills are located, adversely affect wetland vegetation under the boardwalk, and cause minimal disturbance to wetland hydrology.

Trail segments that use gravel fill or gravel on geotextile also cause permafrost degradation beyond the footprint of the trail and impacts to soils. However, this area is in a zone of discontinuous permafrost so the calculated impacts are likely overestimates. This trail treatment adversely impacts wetland vegetation and causes minor to moderate adverse impacts to hydrology. The total area of impact requiring compensatory mitigation is 0.60 acres.

The total impacts to each wetland type in the project area is summarized below. The total area of each wetland type intersected by the trail alignment is shown to illustrate the overall impact to each type. The highest impact from boardwalks on sills is to the vegetation function and the highest impact from gravel fill trail treatment is to permafrost function. The maximum impact from trails and the total wetlands in the project are shown in the table below.

Wetland Type	Total Wetlands Around Trail Alignments (acres)	Trail Footprint and Permafrost Degradation Impact Total (acres)
R3/R4	32.96	0
PEM	0.74	0.0016
PSS	63.58	0.60

## Justification for Use of the Wetlands

One of the main purposes of the proposed trail system, particularly the Nenana River Hiking trail, is to provide access to the Nenana River area and its associated resources. There are no alternatives that provide that access and link to upland trails that completely avoid wetlands.

## Compensatory Mitigation

If required by the Army Corps of Engineers or National Park Service, compensatory mitigation for the 0.60 acres of wetlands disturbance related to this project will be addressed by wetlands restoration projects in Denali National Park.

Both Friday Creek and Eureka Creek in the Kantishna region of Denali National Park are planned for restoration beginning in 2025-2026, and the restoration of these creeks could act as compensation for the 0.60 acres of wetlands disturbed in the Nenana River Trails project. The Friday Creek Project would restore approximately 1.5 acres of riverine wetlands and the Eureka Creek Project would restore approximately 2.5 acres of riverine wetlands.

The wetland types affected by the proposed project are common in the park. The park proposes to use a ratio of 1:1 for restoration of less common riverine wetlands to compensate for the wetland loss.

## Floodplains within the Study Area

There some trail segments within the 50-year floodplain along the Nenana River. Those trail sections would just be brushed and maintained as bare gravels with no additional boardwalks placed. There would not be any adverse affect of the floodplain on the trail and the trail would not effect floodplain functions.

## Conclusion

The proposed trail system would provide public access to wetland and river habitats in the park and would provide interpretive opportunities addressing those resources. The trails would impact 0.6 acres of wetland habitat. The park proposes to provide compensatory mitigation by restoring streams impacted by placer mining in the Kantishna Hills near the end of the Denali Park Road. The park is currently working on preliminary restoration designs for Friday Creek (1.5 acres), but further work cannot be completed until the Polychrome Pass construction project has been completed and access to the end of the Park Road has been restored (~2025).

## Literature Cited

- Arp CD, Simmons T. Analyzing the impacts of off-road vehicle (ORV) trails on watershed processes in Wrangell-St. Elias National Park and Preserve, Alaska. *Environ Manage*. 2012 Mar;49(3):751-66. doi: 10.1007/s00267-012-9811-z. Epub 2012 Feb 12. PMID: 22327506; PMCID: PMC3298735.
- Federal Geographic Data Committee. 2013. Classification of wetlands and deepwater habitats of the United States. FGDC-STD-004-2013. Second Edition. Wetlands Subcommittee, Federal Geographic Data Committee and U.S. Fish and Wildlife Service, Washington, DC.
- Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. The National Wetland Plant List: 2016 wetland ratings. *Phytoneuron* 2016-30: 1–17. Published 28 April 2016. ISSN 2153 733X
- National Park Service. 2016. National Park Service Procedural Manual #77-1: Wetland Protection.
- National Park Service. 2002. National Park Service Procedural Manual #77-2: Floodplain Management.
- State of Alaska Department of Environmental Conservation/U. S. Army Corps of Engineers Waterways Experiment Station Technical Report Number: WRP-DE-\_\_\_\_1999. Operational Draft Guidebook for Reference Based Assessment of the Functions of Precipitation-Driven Wetlands on Discontinuous Permafrost in Interior Alaska. Anchorage, AK.
- USACE 2007 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region (Version 2.0). U.S. Army Corps of Engineers September 2007.

## Appendix C: Estimated Costs

This appendix provides a summary of some of the cost considerations for the Proposed Action and alternatives described in the EA. The information provided here is generalized and is intended to convey only the essential financial implications of the actions described in the EA.

### Costs

The costs summarized below are rough estimates only and are provided to give a general sense of the financial implications of the actions described in the EA. Park staff time required to patrol trails and manage campgrounds are not included in maintenance costs.

Facility Type	Construction Cost	Maintenance Cost
Multiuse Trail	\$184,800/mile	\$2,218/mile Extensive maintenance needed less than yearly
Hiking Trail	\$47,520/mile	\$4,329/mile Minor maintenance on short sections needed approximately yearly
Riley Creek Pedestrian Bridge	\$2 million	Rare
Campgrounds	\$80,000 each	\$17,000 annually for employee time and materials

	Alternative 1: No Action	Alternative 2: Construct Multiuse and Pedestrian Trails (Preferred Alternative)	Alternative 3: Wait for the Railroad Realignment	Alternative 4: Trails and Campgrounds
Total Rough Estimate Cost of Construction	\$0	\$3.9 million	Without realignment: \$2.4 million With realignment: \$3.9 million	\$4.1 million