



Ghiglione Bridge Replacement

Environmental Assessment

May 2020



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Developing and Producing this
Environmental Assessment: \$36,867



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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ON THE COVER

A black and white profile photo of the Ghiglione Bridge, circa 1959. The photo was taken upstream of the bridge facing south/southwest with a clear view of the v-shaped valley that the bridge spans. Beyond the bridge is a view of mountains with mostly cloudy skies.

Photo credit: National Park Service

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1 Proposed Action

The National Park Service proposes to replace Ghiglione Bridge (mile 41.9) of the Denali Park Road (hereafter, Park Road; Figure 1). The proposal includes constructing a new bridge approximately 70 feet upstream (north) of its current location, which is closer to the historic road alignment, and then removing the old bridge. The proposed action would modify the roadway adjacent to the bridge (approximately 300 feet in total length) to soften the approach angles of vehicles entering and exiting the bridge and increase sight distances. This project would extend through two summer seasons and is scheduled to begin in 2021.

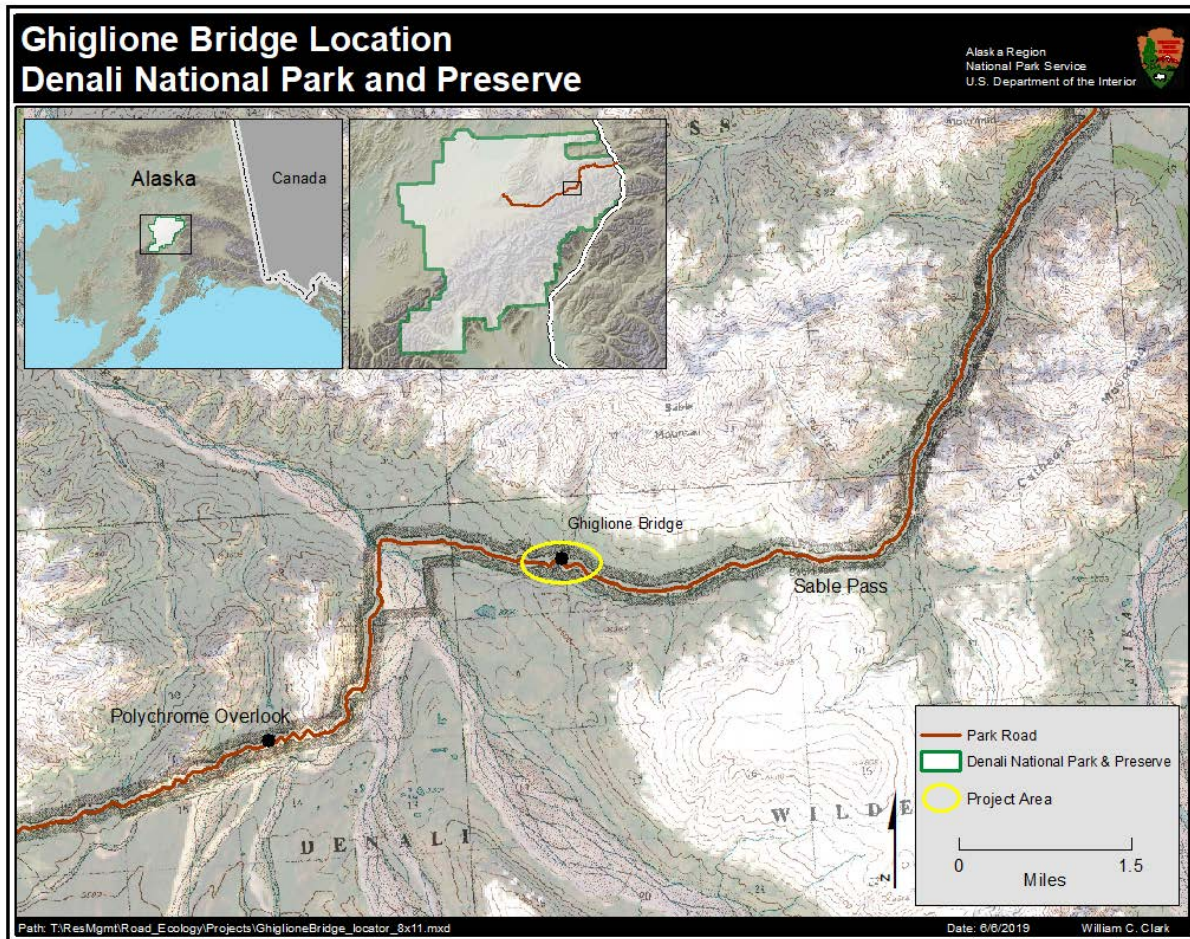
2 Purpose and Need

The purpose of this project is to replace Ghiglione Bridge, constructed in 1960, which crosses a small, unnamed creek on the Park Road in Denali National Park and Preserve. In 2015, Ghiglione Bridge received a “B” replacement priority rating from the Federal Highway Administration because it was determined “seriously deficient” and presented “a safety hazard.” Ghiglione Bridge has remained in service with frequent inspections to monitor its integrity. Seismic events, particularly magnitude 6.7 and 7.9 earthquakes in 2002, and age have contributed to the deficient state of Ghiglione Bridge.

Ghiglione Bridge needs to be replaced to mitigate public risk and ensure continuity of park operations. As a dead-end road, bridges are critically important to visitor safety, park operations, and recreation opportunities because they ensure the only means of overland park egress.

Ghiglione Bridge was not designed for the volume and kind of traffic on the road today. Approximately 9,000 vehicles transport 260,000 passengers across Ghiglione Bridge between May and September annually (National Park Service 2018a); 60% of the total park road traffic crosses this bridge (National Park Service 2018c). Park visitation has increased over 2,800% since Ghiglione Bridge was designed in the 1950s. Additionally, the vehicles used for public transport today are larger than vehicles commonly used when the bridge was designed. (National Park Service 2018c).

Figure 1. Location of Ghiglione Bridge in Denali National Park and Preserve.



3 Background

The project area includes a portion of the Park Road at mile 41.9 with Ghiglione Bridge crossing a small, unnamed creek at an elevation of 3,200 feet above sea level. The Alaska Road Commission completed the Park Road in 1938. The majority of the Park Road, including the project area, is eligible for inclusion in the National Register of Historic Places. The National Park Service identified Ghiglione Bridge, constructed between 1958 and 1960 during the Mission 66 era, as a contributing element to the Mount McKinley National Park Road Historic District (Mathews et al. 2018).

4 Issues

Issues Selected for Detailed Analysis

This Environmental Assessment evaluates the following issues:

Soils: Removal of the existing bridge and construction of a new bridge would disturb native tundra soil.

Vegetation: Earthwork for bridge construction would remove areas of tundra and riparian vegetation in the project area, altering vegetation communities and potentially introducing non-native species.

Wildlife: The proposed project would require removing a recently occupied raven nest built on the existing bridge's support structures. The proposed project would create localized disturbance to wildlife from increased activity, noise, and dust.

Cultural Resources: Removing Ghiglione Bridge would destroy a contributing feature of the Mount McKinley National Park Road Historic District and the Mount McKinley National Park Road Cultural Landscape. The design of the proposed replacement bridge is compatible with the historic district in terms of design, materials, setting, and location.

Soundscape: The construction phase of the project would require heavy equipment moving earth and pile-driving that would disrupt the soundscape in the local vicinity.

Recreation: Bridge replacement would affect public recreation by increasing long-term safety and reliability of park access. Bridge construction may disrupt recreation with traffic delays, loud noises, and an increase dust in the vicinity of the proposed project. Project construction and operations may displace wildlife, decreasing wildlife viewing opportunities in the vicinity of the bridge. Additionally, the project would be visible from the valley floor and many high points in the surrounding landscape where hiking is permitted, including within designated wilderness.

Issues Considered but Dismissed

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

Air Quality: Exhaust from large equipment would affect air quality but would be limited to a small number of machines operating during the construction period and localized in the vicinity of the project site. Air quality was dismissed from further consideration.

Subsistence: The proposed project would not diminish abundance, availability, or access to subsistence resources (Appendix A). Subsistence was dismissed from further consideration.

Threatened and Endangered Species: Denali National Park and Preserve does not have any documented threatened or endangered species. Threatened and endangered species were dismissed from further consideration.

Wetlands: Relocating the bridge upstream would permanently affect two palustrine wetlands and a riverine wetland. The palustrine wetlands (classified as scrub-shrub, broad-leaved deciduous, and seasonally flooded/saturated) total less than 0.1 acres (Sharpe 2018). Approximately 0.1 acres of riverine wetland would be impacted during construction. The total acreage of these impacts is below the allowable disturbance threshold of bridge replacement projects to require mitigation as outlined in National Park Service Procedural Manual #77-1 §4.2.1.8. The un-named seasonal small stream crossed by the bridge would be avoided to the greatest extent practicable; work on the adjacent slopes would occur during dryer periods. Wetland resource issues were dismissed from further consideration.

5 Alternatives

Alternative 1: No Action

Under Alternative 1, Ghiglione Bridge would not be removed nor replaced in a new location. Park operations and local business operations would continue using the existing bridge provided that the condition of the bridge allows safe transit. Frequent inspections would continue as advised by the FWHA inspection rating. Ghiglione Bridge would be closed if deemed unsafe resulting in visitor traffic turning around prior to mile 41.9.

Alternative 2: Replace Ghiglione Bridge

(Proposed Action and Preferred Alternative)

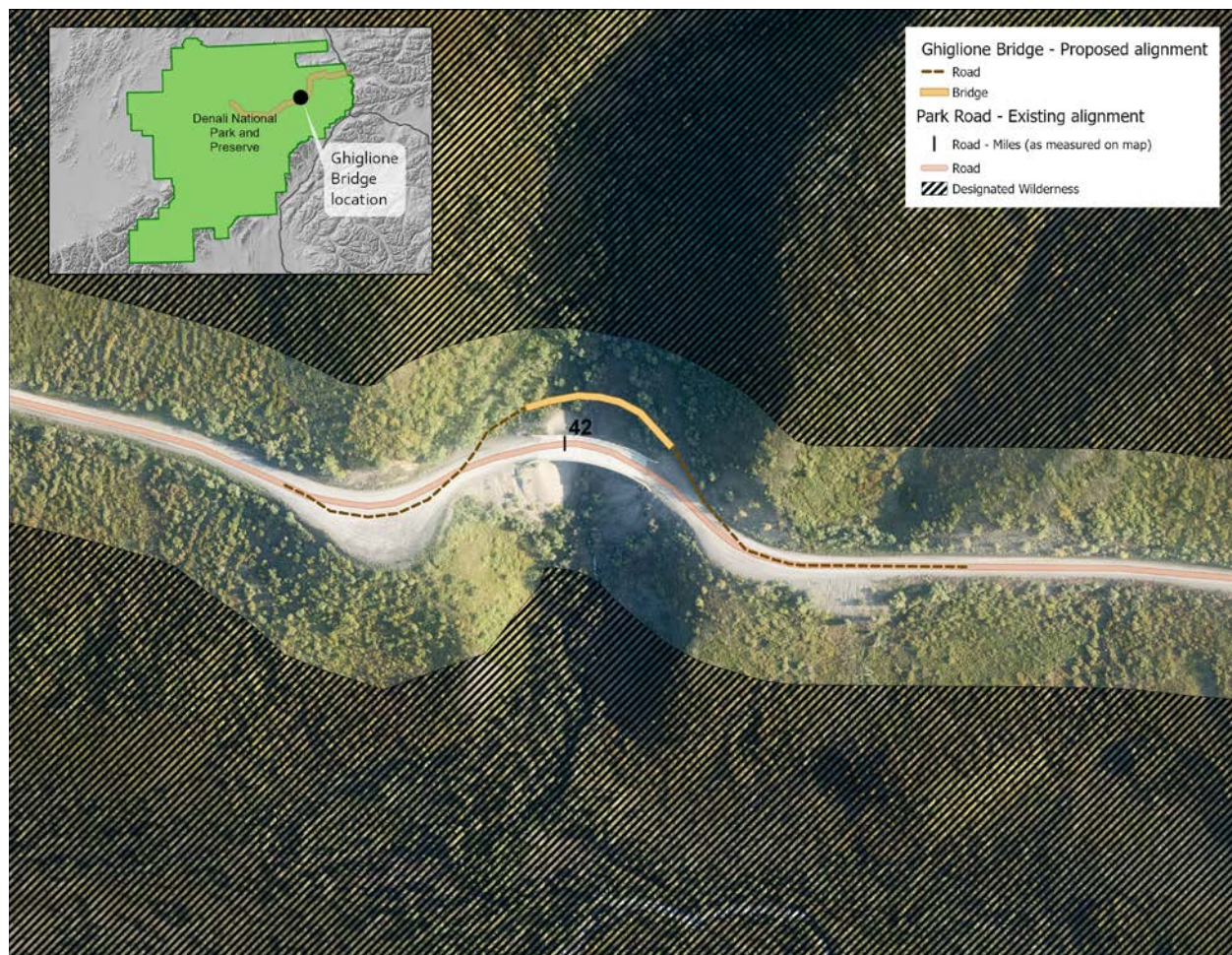
Under Alternative 2, Ghiglione Bridge would be replaced with a 180-foot concrete and steel curved bridge with wooden rails, located 70 feet north of the existing bridge, closer to the original alignment. Approximately 150 linear feet of total road length would be added to connect the existing park road to the east and west ends of the bridge. These new bridge approaches would improve sight distances and soften approach and exit curves for larger vehicles. The proposed bridge replacement would be compatible with the Mount McKinley National Park Road Historic District in terms of design, materials, setting, and location.

The replacement bridge would require 20 steel piles (18-inch diameter) for piers and abutments. Each pile is estimated to take one day to drive and occur entirely in year one of construction. Vibratory pile driving is proposed for the initial stage of installation (until the top of the pile reaches an elevation of approximately 3,340 feet). After this, an impact hammer is proposed to drive the piles the rest of the way. The vibratory technique produces less noise than use of the impact hammer.

Vegetation clearing would take place during the fall prior to construction to comply with Migratory Bird Treaty Act guidelines. Construction would occur over two summer seasons, approximately June 1 through September 30. Revegetation of new disturbance and reclaimed areas would follow a park-developed revegetation plan to prevent non-native species from establishing in the project area, including stipulations such as: use only native soils and seeds; collect native seed prior to project start to minimize fallow period when non-natives are more likely to invade; chip existing vegetation as substrate for revegetation; and power wash vehicles before entering the park road corridor. The existing bridge would continue to be used during the project providing through traffic access. Limited delays or closures controlled by a flagger would likely be necessary during some phases of construction.

In year two of construction, the existing bridge would be dismantled. All concrete and rebar from the bridge would be removed from the park and taken to a suitable disposal site. Approximately 4,200 cubic yards of fill adjacent to the existing bridge abutments would remain in place and would be removed from the project site within 5 years of project initiation for future projects, such as fill for the Pretty Rocks landslide area. Fill removal would prevent downstream movement once unanchored from the bridge abutments.

Figure 2. Proposed Alignment of Ghiglione Bridge



Alternatives Considered but Dismissed

Rehabilitate Ghiglione Bridge: The National Park Service considered rehabilitating Ghiglione Bridge to meet current earthquake and the American Association of State and Highway Transportation Officials Load and Resistance Factor Design standards. The Federal Highway Administration estimated a rehabilitation project would cost nearly 80% of the total cost of a bridge replacement. The National Park Service determined that rehabilitation of Ghiglione Bridge is not fiscally judicious and dismissed this alternative from analysis.

Replace Ghiglione Bridge with a culvert: The National Park Service considered replacing Ghiglione Bridge with an 18-foot diameter, 130-foot long culvert. Improving sight distances would not be necessary because the road alignment would remain the same. The agency has determined that replacement of a Mission 66 era bridge with a culvert would too greatly adversely affect the Mount McKinley National Park Road Cultural Landscape. Moreover, alternatives that would use the current alignment would cause interruptions and delays to traffic the agency determined unacceptable. This alternative was dismissed from analysis.

Table 1. Summary of alternatives

Action	Alternative 1: No Action	Alternative 2: Replace Ghiglione Bridge (Proposed Action and Preferred Alternative)
Bridge Replacement	<ul style="list-style-type: none"> • Existing bridge would remain in place • Inspections would continue as advised and scheduled by the Federal Highway Administration • Gravels would remain in place; no action taken 	<ul style="list-style-type: none"> • Construct 180-foot concrete and steel curved bridge with wooden rails compatible with Mount McKinley National Park Road Historic District • Located 70 feet upstream of current location • Install 25 pilings (estimated vibratory) for piers and abutments • Construct approximately 150 feet of road approach for each end of the bridge • Vegetation clearing during the fall prior to construction • Existing bridge used to minimize need for traffic delays or lane closures during construction of new bridge • Traffic control throughout construction period • Remove/grind existing bridge to generate approximately 200 cubic yards of fill • Approximately 4,200 cubic yards of material would be removed from the creek banks beneath the existing bridge within five years of project initiation and used for future projects within the park

6 Affected Environment

Soils

Four boreholes were drilled between 2016 and 2018. Soils of the project area consist of mostly sandy, medium-density, alluvial gravels 5 to 15 feet deep below the thin organic tundra mat (Federal Highways Administration 2016, 2018). The larger Sable Pass area is comprised of discontinuous permafrost (Natural Resources Conservation Service 2004). However, boreholes did not include thermistor data and thus, permafrost presence cannot be confirmed. However, one borehole indicated the possibility of permafrost at 34 feet (Federal Highways Administration 2018).

Some portion of these soils have been previously disturbed from historic road alignments prior to the 1950s. There are no formal or informal trails affecting soils in the project area, which lies within the protected Sable Pass Wildlife Viewing Area.

Vegetation

The immediate and adjacent project areas consist of two vegetation communities, upland areas where the bridge approach/exit curves would be constructed and a riparian corridor where three piers would be constructed. The upland is subalpine tundra dominated by *Vaccinium uliginosum*, *Betula nana*, *Salix alaxensis*, *Dryas octopetala* and *Cladina* spp. on a southern aspect. The second community, nearer the stream, is a complex of palustrine and riverine wetland vegetation: *S. barclayi*, *S. pulchra*, *Dasiphora fruticosa*, *Equisetum arvense* and *E. scirpoides* (Sharpe 2018).

Some portion of these communities have been previously disturbed when the historic road alignment passed through them prior to the 1950s (National Park Service 2017). There are no formal or informal trails in the project area, which lies within the protected Sable Pass Wildlife Viewing Area (Code of Federal Regulations 13.918).

The project area was free of non-native plant species in 2015 and 2019 site surveys. Non-native species have not been recorded in the project area at least since 1999.

Wildlife

The project area is within the Sable Pass Wildlife Viewing Area, originally established in park regulations in 1956 to protect wildlife from visitor harassment. The project area provides habitat for grizzly bears (*Ursus actos*), caribou (*Rangifer tarandus*), Common Ravens (*Corvus corax*), Willow Ptarmigan (*Lagopus lagopus*), and arctic ground squirrels (*Spermophilus parryii*). Dall sheep (*Ovis dalli*) frequent the slopes of the nearby Sable Mountain and associated ridge habitat.

Cultural Resources

The project area includes the Park Road which is eligible to be listed on the National Register of Historic Places. “The road was designed to flow and blend with the landscape and a sinuous route over hills and valleys is one of its important features” (National Park Service 2019). It is considered historically significant because it is associated with the period of scenic road development in national parks in the 1920s and 1930s as well as the Mission 66 park infrastructure development initiative that spanned the 1950s and 1960s (National Park Service 2019). Additionally, Ghiglione Bridge, a Mission 66 project, is a contributing element to the Mount McKinley National Park Road Cultural Landscape (Mathews et al. 2018).

The historic alignment of Ghiglione Bridge and the associated road segments from the 1930s can be seen in the field north of the existing and proposed alignments, and by using remote sensing (National Park Service 2017).

National Park Service archaeologists have surveyed the project area. In addition to the original wooden bridge’s pilings and retaining wall, one possible historic site of two 55-gallon drums and some milled lumber were identified near the project area but outside of the area of potential effect (National Park Service 2017). No prehistoric artifacts or cultural resources were found.

Soundscape

Because sound spreads out in space, the analysis of acoustic impacts considers a slightly larger analysis area, including the open subalpine slopes west of Sable Pass. In 1956, Congress closed the area surrounding Sable Pass (Sable Pass Wildlife Viewing Area) to visitors on foot. Since that time, disturbance from both vehicle and aircraft noise has increased extensively within the closure.

This is a naturally energetic acoustic environment due to wind and rapidly flowing water during the summer months. Several small streams, including the one Ghiglione Bridge crosses, intersect the analysis area. Approximately 9,000 vehicles pass through the area annually and current aviation best

practices (voluntary) encourage operators to follow the park road corridor to avoid more remote areas of Denali National Park's designated wilderness (Denali Aircraft Overflights Advisory Committee 2012).

Quantitatively, the National Park Service considers the *natural ambient level* to be the 50th percentile sound level that exists in the absence of human-caused noise. To estimate conditions typical of the analysis area, measurements from the nearby East Fork monitoring site provide an upper bound with a natural ambient level of 40.6 decibels (National Park Service 2012). Moving away from the East Fork Toklat River, the natural ambient level decreases (save for areas immediately adjacent to streams). Acoustic measurement sites located at similar elevations in Denali National Park and Preserve (within approximately 330 feet elevation of the affected environment, with a sample size of 11), had a median natural ambient level of 34.1 decibels (Withers 2011, Withers 2012, Withers and Betchkal 2013, Betchkal 2013a, Betchkal 2013b, Betchkal 2015). This lower value will be used as a proxy for natural ambient level within the affected area, and a baseline from which to measure noise impacts as per National Park Service Management Policies §8.2.3 (National Park Service 2006).

Noise impacts along the Denali Park Road are intense and seasonal. Over one-hundred road noise-related events and approximately 13 overflights per day were recorded at the East Fork in the summer of 2012. The median noise-free interval was approximately 5 minutes. At a distance of 150 feet from the Park Road centerline (within designated wilderness), the maximum one-second equivalent sound level during a vehicle pass-by ranged from 38.1 to 75.5 decibels; overflight maximum one-second equivalent sound levels ranged from 33.2 to 72.2 decibels at the East Fork site (National Park Service 2019a).

Recreation

Denali National Park was established for public benefit and enjoyment and for the protection of scenery and wildlife. Grizzly bears, caribou, Common Ravens, and Willow Ptarmigan are among the wildlife species observed in the vicinity of the proposed project area (National Park Service 2018b). Dall sheep are frequently viewed on nearby mountainsides (National Park Service 2018b).

Approximately 260,000 visitors travel through the project area annually and over 90% of park visitors rank wildlife viewing as an important reason for their visit (Meldrum 2007, Manni 2012). Over half of visitors consider "sightseeing/wildlife viewing from a bus" their main activity while at the park (Fix 2011). Busses occasionally stop in the vicinity of Ghiglione Bridge to watch an active raven nest on the bridge support structures and to look for wildlife in the expansive valley known as the Plains of Murie.

While most visitors travel the Park Road by bus, some visitors hike and cycle the road corridor within the proposed project area. The project area is typically quiet to pass through. The proposed project area would be visible from the valley floor or high points in the surrounding landscape, including from within designated wilderness.

7 Impact Analysis

Alternative 1: No Action

Under the No Action alternative, Ghiglione Bridge would not be replaced, and the existing bridge would continue to provide vehicle access. Existing public safety concerns would continue to be addressed by inspections as advised and scheduled by FWHA.

Visitor services would be administered under current direction and no new management actions would be implemented to mitigate the use of or exposure to the existing bridge's structure. Approximately 9,000 vehicles would continue use of Ghiglione Bridge annually.

The No Action alternative would not generate direct or indirect effects to park resources and therefore would have no contribution to cumulative impacts.

Alternative 2: Replace Ghiglione Bridge

Proposed Action and Preferred Alternative – Direct and Indirect Impacts

Soils and Vegetation

Replacing Ghiglione Bridge with a new bridge upstream of the current alignment would excavate an estimated 1,400 cubic yards of tundra soils and clear approximately 1.5 acres of predominantly tundra and streamside vegetation and soils. The vegetation and soils in the proposed project area are commonly found in the park, thus loss of approximately 1.5 acres of these types is unlikely to diminish health or value of the larger ecosystem. The area was successfully revegetated after the original bridge construction during the development of the park road, and again after construction of the existing Ghiglione Bridge.

Vegetation would be removed prior to construction and re-seeding would take place in the fall after construction concludes. Vegetation would be absent from the project area for approximately one calendar year. A plan would be developed by park staff to outline the preferred methods and species used for revegetation of the affected project areas. Site revegetation using salvaged vegetation mats and native seed sources is estimated to require one to three years. The introduction of non-native plant species into the park would be possible because the project would involve earthwork, including removing fill near the existing bridge abutments, installing new abutments, re-grading slopes, and re-aligning the road. However, implementing the park's revegetation plan would decrease the probability of introducing non-native plant species.

Salvaging 4,200 cubic yards of fill from the existing bridge abutments would supply gravel needs for other park projects, decreasing gravel extraction elsewhere in the park. Incidental soil compaction is possible in the proposed project area.

Wildlife

Impacts to wildlife commonly found in the park, including grizzly bears, caribou, Dall sheep, Common Ravens, and Willow Ptarmigan, would be generated primarily during the project construction period. Increased human activity, dust, and construction noise, particularly pile-driving, could stress wildlife in the vicinity of the proposed project (Creel 2002). Startle responses in wildlife could be induced and animals could be displaced from the area throughout the two summer seasons proposed for construction. Birds or small mammals breeding in the area could be displaced, resulting in reproductive failure or death of dependent young. While individuals may be temporarily stressed or displaced, impacts are not likely to have population-level effects.

A specific displacement example includes a raven nest on the center support of the existing bridge structure. Before initiating construction, the nest, which has been used for several years, would be removed prior to the nesting season. This nesting pair would likely be displaced to another location, but Common Raven populations in the park would not likely be affected. In addition, ravens are efficient predators on other birds and small mammals. The removal of the nest from an artificial structure may reduce raven predation on other species native to the area.

Cultural Resources

Replacing Ghiglione Bridge is considered an adverse effect to the historic integrity of the Park Road, per the National Historic Preservation Act and its implementing regulations (36 CFR Part 800). An agreement document is being prepared, in consultation with SHPO, with mitigation for the adverse effects to include extensive documentation of the existing bridge and using era-appropriate design elements for the new bridge. Proposals for documentation of the historic bridge include detailed, high resolution photographs and a three-dimensional scan of the structure.

The replacement bridge is proposed to have a rustic, simple appearance that blends with the landscape at a scale suitable for the curving location on the road. The proposed alignment for the replacement bridge is closer to the historic alignment. The siting and width of the bridge would encourage low vehicle speeds, fitting with the rustic character of the road (National Park Service 2019b).

Soundscape

Removing and replacing Ghiglione Bridge would generate several temporary changes to the acoustic environment. Road vehicles that normally travel near the speed limit of 35 miles per hour would be slowed by construction. This would increase the duration of audible noise in the area, while reducing overall engine speed and thus sound level (Priede 1971). At most times, reductions in amplitude would be outweighed by the increase from construction activities.

Heavy vehicles, earth-moving equipment, and power tools would generate noise during construction. These have sound levels that range between 70 and 100 decibels at 50 feet (Environmental Protection Agency 1971). Field measurements have shown construction on the Park Road to be clearly audible at distances of approximately 4,300 to 4,600 feet (Withers 2011, Betchkal 2013a). Impacts were

caused by many simultaneous sources, with backup alarms particularly noticeable. Construction noise was audible for large portions of an average day: 15 to 19% (3.6 to 4.6 hours of the day).

A particularly impactful element of the project is pile driving. Hammer blows to a 24-inch pile were shown to have an instantaneous sound level of 103 decibels at 50 feet (WSDOT 2012). However, the same authors state that if, “smaller diameter piles are used, it may be appropriate to substitute lower values.” This project is designed with 12 and 18-inch piles. Lacking detailed information on piles this size, the more protective published value is used. Given natural ambient levels in this area (34.1 decibels) and the equations governing spreading loss, unmitigated pile driving is expected to be audible within approximately 1.7 miles. This would overlap most of the Sable Pass Wildlife Viewing Area, the East Fork Cabin, and backcountry areas 7, 29, and 30.

The use of broadband, amplitude-adjusting backup alarms would mitigate the distance at which construction activities impact wildlife and visitors. These modern devices improve both resource condition and safety for workers on the construction site (Betchkal 2018). The park’s entire vehicle fleet has been retrofitted with such alarms and it has become a standard in park construction contracts since 2017.

If engineering specifications of the bridge allow, vibratory piling would be a highly effective way to reduce noise levels from the project (Environmental Protection Agency 1971, Gill 1982). If an impact hammer is necessary, a Barrier Backed Composite Curtain surrounding the hammer and pile on three sides could be used to reduce noise levels from the project (Paulus, Sokolowski and Sartor Engineering 2006). The reported 10 decibel reduction could potentially decrease the noise-affected area by a factor of 10.

Recreation

Construction activity, dust, and noise, including about 25 days of pile-driving, may displace visitors from popular backcountry areas (6, 7, 8, 29, 30, and 31) located near the proposed project site. Information regarding construction activities and timing would be available to visitors requesting backcountry permits. Visitors would likely be able to substitute with opportunities in alternate locations throughout the two summer seasons encumbered by construction activities.

Visitors traveling by bus may encounter traffic delays, increased dust, and noise in the vicinity of the proposed construction activities. Removing the raven nest from the bridge support would remove a locally favorite wildlife viewing opportunity. Acoustic impacts to the Sable Pass Wildlife Viewing Area may decrease opportunities for viewing wildlife during the construction seasons.

Proposed Action and Preferred Alternative – Cumulative Impacts

Cumulative impacts consider the incremental contribution of the direct and indirect impacts to past, present, and reasonably foreseeable future actions that would affect resources in the vicinity of the proposed project.

Past actions include changes to the road alignment in the project area between 1938 and the 1950s, though the reasons for the alignment change were not documented. Construction of the existing

Ghiglione Bridge was completed in 1960; routine maintenance of the bridge and associated road section has been conducted over time and continue as recommended by the Federal Highway Administration. Cyclic road maintenance is ongoing, and is expected to continue through future years, including rehabilitation of other historic bridges from the Mission 66 era at Sanctuary, Toklat #1, and Stoney in 2021.

A perennially unstable slope at mile 45.4 on the Park Road, known as Pretty Rocks in the vicinity of Polychrome Pass, is becoming less stable; the rate of slope failure or earthflow continues to increase. While the National Park Service and Federal Highway Administration are conducting numerous studies and evaluating feasibility of a variety of potential solutions for this situation, the only reasonably foreseeable future action by the agency is to continue maintenance at the site, striving to maintain connectivity through this section. A definitive long-term solution has not yet been identified to address the situation, and therefore cannot be considered a reasonably foreseeable future action at this time.

Implementation of Alternative 2 would contribute to cumulative impacts on vegetation and soils in the vicinity of the project area. Several bridge crossings have been previously established and reclaimed in this area. Soils and vegetation have been disturbed and stabilized in prior construction, deconstruction, and reconstruction efforts. Alternative 2 would add additional disturbance in this area, with high expectations for successful soil stabilization, revegetation, and avoiding introduction of non-native species.

Alternative 2 would also contribute to cumulative impacts on wildlife in the vicinity of the project area, including grizzly bears, caribou, Dall sheep, Common Ravens, and Willow Ptarmigan. Displacement and stress would be most probable during the construction period (estimated over two summer seasons) and could persist at low levels during the operation of the new bridge. Wildlife in the vicinity of the Park Road have largely adapted to the ongoing presence of vehicles on the park road in the summer months, but acute noise at high volumes could contribute to wildlife stress and displacement. Impacts would likely be associated with individual animals, rather than wildlife populations. The contribution to cumulative effects on wildlife distribution and behavior is expected to return to typical patterns after the construction period.

Removing Ghiglione Bridge, an historic feature on the Park Road, would adversely impact a contributing element to the Mount McKinley National Park Road Cultural Landscape and the Mount McKinley National Park Road Historic District. The historic structure would be thoroughly documented prior to its removal, and the proposed replacement structure would be compatible with the historic district in terms of design, materials, setting and location. Nonetheless, the action would have a permanent contribution to adverse cumulative impacts to cultural resources. The historic structure would be thoroughly documented prior to its removal, and the proposed replacement structure would be compatible with the historic district in terms of design, materials, setting and location. Nonetheless, the action would have a permanent contribution to adverse cumulative impacts to cultural resources. Proposed future rehabilitation of bridges constructed in the same era would assist in stabilizing conditions of these features and the integrity of the Mount McKinley National Park Road Cultural Landscape. The Memorandum of Agreement between the National Park Service and

State Historic Preservation Officer, which documents mitigations for removal of the Ghiglione Bridge, acknowledges eventual removal of the remaining six Mission 66 bridges in the park.

The soundscape and recreation resources in the vicinity of the proposed project would primarily experience adverse impacts during the construction period. Noise generated by construction activities would temporarily alter the soundscape (estimated for two summer seasons), potentially displacing recreationists from popular backcountry use areas near Ghiglione Bridge and decreasing opportunities for wildlife viewing in the Sable Pass Wildlife Viewing Area. The contribution to cumulative impacts on these resources would likely return to baseline levels when construction is complete.

Table 2. Summary of resource impacts by alternative

Resource	Alternative 1: No Action	Alternative 2: Replace Ghiglione Bridge (Proposed Action and Preferred Alternative)
Soils	No new impacts	<ul style="list-style-type: none"> • Approximately 1,400 cubic yards of soil excavated for construction • Approximately 4,200 cubic yards of material salvaged from existing bridge abutments for use elsewhere in the park
Vegetation	No new impacts	<ul style="list-style-type: none"> • Approximately 1.5 acres of vegetation removed during construction • Potential exposure to vectors for introducing non-native species and non-native soil mixing • Implement park revegetation plan to decrease probability of introducing non-native species • Revegetation with tundra mats and native seed
Wildlife	No new impacts	<ul style="list-style-type: none"> • Displacement and stress due to human activity, noise, and dust over two summer construction seasons • Raven nest removed; nesting pair displaced
Cultural Resources	No new impacts	<ul style="list-style-type: none"> • Adverse effect to historic integrity of Park Road due to removal of historic bridge; addressed through a Programmatic Agreement that requires documentation of historic structure (3-dimensional scan and photos) and replacement with an historically compatible bridge
Soundscape	No new impacts	<ul style="list-style-type: none"> • Net increase in noise during construction period from heavy equipment and power tools • Notable noise sources would include backup alarms and pile driving • Use broadband, amplitude adjusting backup alarms, vibratory pile driving (if compatible with engineering requirements), and a Barrier Backed Composite Curtain to reduce acoustic impacts • Acoustic impacts likely during construction period in Sable Pass Wildlife Viewing Area, East Fork Cabin, and backcountry areas 7, 29, and 30
Recreation	No new impacts	<ul style="list-style-type: none"> • Construction activity, dust, and noise may displace visitors in backcountry areas 6, 7, 8, 29, 30, and 31 • Potential traffic delays for visitors during construction period • Provide construction updates to visitors to facilitate selecting alternate locations for recreation • Wildlife displacement could decrease wildlife-viewing opportunities

8 Consultation and Coordination

Persons Consulted

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Paul Franke, Roads Supervisor
Phoebe Gilbert, Denali National Park and Preserve Cultural Resources Team Lead
Jakara Hubbard, Outdoor Rec Planner and Pretty Rocks Project Coordinator
Joan Kluwe, Alaska Region Environmental Coordinator
Wendy Mahovlic, Denali National Park and Preserve Exotic Plant Management Team
Ray Moore, Denali National Park and Preserve Maintenance Supervisor
Dave Schirokauer, Denali National Park and Preserve Resources Team Lead
Norm Sollie, West District Maintenance Supervisor
Sarah Stehn, Denali National Park and Preserve Botanist

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Appendix A:

Alaska National Interest Lands Conservation Act 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. It summarizes the evaluation of potential restrictions to subsistence activities that could result from the replacement of Ghiglione Bridge (mile 41.9) of the Park Road in Denali National Park and Preserve.

II. The Evaluation Process

Introduce 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.”*

Section 202(3) of the act 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 the Alaska National Interest Lands Conservation Act established national parks for the following purposes:

“ . . . to preserve unrivaled scenic and geological values associated with natural landscapes; to provide for the maintenance of sound populations of, and habitat for, wildlife species of

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

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

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

III. Proposed Action on Federal Lands

Alternatives 1 and 2 are described in detail in the environmental assessment for this project. Customary and traditional subsistence use on lands managed by the National Park Service 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 the Alaska National Interest Lands Conservation Act.

A. Alternative 1 – No Action

Under Alternative 1, Ghiglione Bridge would not be removed nor replaced in a new location. Park operations and local business operations would continue using the existing bridge provided that the condition of the bridge allows safe transit. Frequent inspections would continue as advised by the FWHA inspection rating. Ghiglione Bridge would be closed if deemed unsafe resulting in visitor traffic turning around prior to mile 41.9.

B. Alternative 2 – Replace Ghiglione Bridge

(Proposed Action and Preferred Alternative)

Under Alternative 2, Ghiglione Bridge would be replaced with a 180-foot concrete and steel curved bridge with wooden rails, located 70 feet north of the existing bridge, closer to the original alignment. Approximately 150 linear feet of road on each the east and west end of the bridge abutments would be re-aligned to improve sight distances and soften approach and exit radii for larger vehicles. The proposed bridge replacement would be compatible with the Mount McKinley National Park Road Historic District in terms of design, materials, setting, and location.

IV. Affected Environment

Subsistence uses within Denali National Park and Preserve are permitted in accordance with Titles II and VIII of the Alaska National Interest Lands Conservation Act. Section 202(3)(a) of the act 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 National Park Service 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. Rock and willow ptarmigan, grouse, ducks and geese are important subsistence wildlife resources.

The National Park Service 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.

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 the Alaska National Interest Lands Conservation Act and Federal and State regulations provide protection for fish and wildlife populations within Denali National Park and Preserve.

Replacement of Ghiglione Bridge (Alternative 2) has the potential to stress or displace individual animals in the vicinity of the project area, including grizzly bears, caribou, Dall sheep, and willow ptarmigan. Effects would be most probable during the construction period (estimated over two summer seasons) and could persist at low levels during the operation of the new bridge. Wildlife in the area have largely adapted to the presence of vehicles during summer months. The proposed project would not result in significant adverse

impacts on the distribution or migration patterns of subsistence resources. Therefore, no change in the availability of subsistence resources is anticipated as a result of the implementation of this proposed action.

B. Restriction of Access:

Section 811 of the Alaska National Interest Lands Conservation Act 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.” Traditional access for Title VIII subsistence uses should not be significantly restricted under the proposed action.

Alternative 1 (No Action), and Alternative 2 (Proposed Action), are not anticipated to significantly limit or restrict the access to subsistence uses within the additions of Denali National Park or Denali National Preserve established by the Alaska National Interest Lands Conservation Act. Federal and State regulations assure the continued viability of fish and wildlife populations.

C. Increase in Competition:

Alternative 1 (No Action) and Alternative 2 (Proposed Action) are not expected to result in increased competition for fish, wildlife or other resources that would significantly impact subsistence users in Denali National Park and Preserve. Federal and State regulations assure the continued viability of particular fish or wildlife populations.

VI. Availability of Other Lands

The proposed project is site-specific to the vicinity of Ghiglione Bridge in Denali National Park and Preserve. It has been determined that no other federally managed lands would be suitable for this project.

VII. Alternatives Considered

Two alternatives were analyzed for this project and are described in detail in the Environmental Assessment. These alternatives occur within the same area of Denali National Park and Preserve, where Title VIII subsistence uses are not authorized. Neither of the two alternatives proposed would significantly restrict subsistence uses on other adjacent federally managed lands.

VIII. Findings

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

