National Park Service • US Department of the Interior

# Mount Rainier National Park

## Fryingpan Creek Bridge Replacement Project Environmental Assessment

April 2023

# US DEPARTMENT OF THE INTERIOR, NATIONAL PARK SERVICE
# MOUNT RAINIER NATIONAL PARK

## FRYINGPAN CREEK BRIDGE REPLACEMENT PROJECT
## ENVIRONMENTAL ASSESSMENT

The National Park Service (NPS) has prepared this environmental assessment (EA) to evaluate the impacts of improving the Fryingpan Creek Bridge in Mount Rainier National Park (the park) located in Pierce County, Washington. The proposed project would replace the existing deteriorated Fryingpan Creek Bridge to ensure sustainable vehicular access to the Sunrise area of the park. The Federal Highway Administration (FHWA) is a cooperating agency in the preparation of this EA.

This EA presents three alternatives for improving the Fryingpan Creek Bridge, describes the alternatives, and analyzes the environmental consequences of implementing the alternatives. Under alternative A (no-action alternative), no improvements would be made to the Fryingpan Creek Bridge, but routine maintenance would continue. Under alternative B (new bridge on a new alignment downstream of the existing bridge), a new bridge would be constructed slightly downstream of the existing bridge, and the existing bridge and abutments would be removed after construction of the new bridge is complete. Under alternative C (new bridge on the existing alignment), a new bridge would be constructed on the existing alignment to retain as many of the cultural elements of the existing bridge as possible. Alternatives B and C would each result in a wider and longer bridge than the existing bridge to minimize encroachment on the river channel and provide a pedestrian walkway that meets accessibility standards. The NPS identified alternative B as the proposed action/preferred alternative.

This EA has been prepared to meet NPS guidelines that implement the National Environmental Policy Act (NEPA) of 1969, as amended, and in accordance with Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended. This EA provides the decision-making framework to 1) analyze a reasonable range of alternatives to meet the objectives of the proposal, 2) evaluate potential issues and impacts on the park's resources and values, and 3) identify mitigation measures that would lessen the degree or extent of these impacts.

### How to Comment

We invite you to comment on this EA during the 30-day public review period. The preferred method of providing comments is through the NPS Planning, Environment, and Public Comment (PEPC) website at: https://parkplanning.nps.gov/FryingpanCreekBridgeEA.

The notice of availability will be posted on the PEPC website. You should be aware that your entire comment — including personal identifying information such as your address, phone number, and email address — may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information, the NPS cannot guarantee that we will be able to do so.

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# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| ABA | Architectural Barriers Act |
| BMP | Best Management Practices |
| CFR | Code of Federal Regulations |
| dB | Decibel |
| dBA | A-weighted decibel |
| DBH | Diameter at Breast Height |
| EA | Environmental Assessment |
| EFH | Essential Fish Habitat |
| ESA | Endangered Species Act |
| ESU | Evolutionarily Significant Unit |
| FHWA | Federal Highway Administration |
| NEPA | National Environmental Policy Act |
| NHLD | National Historic Landmark District |
| NHPA | National Historic Preservation Act |
| NMFS | National Marine Fisheries Service |
| NPS | National Park Service |
| NRHP | National Register of Historic Places |
| OHWM | Ordinary High-water Mark |
| park | Mount Rainier National Park |
| PEPC | Planning, Environment, and Public Comment |
| RV | Recreational Vehicles |
| SHPO | State Historic Preservation Office |
| USC | United States Code |
| USFWS | US Fish and Wildlife Service |

# CHAPTER 1: PURPOSE OF AND NEED FOR ACTION

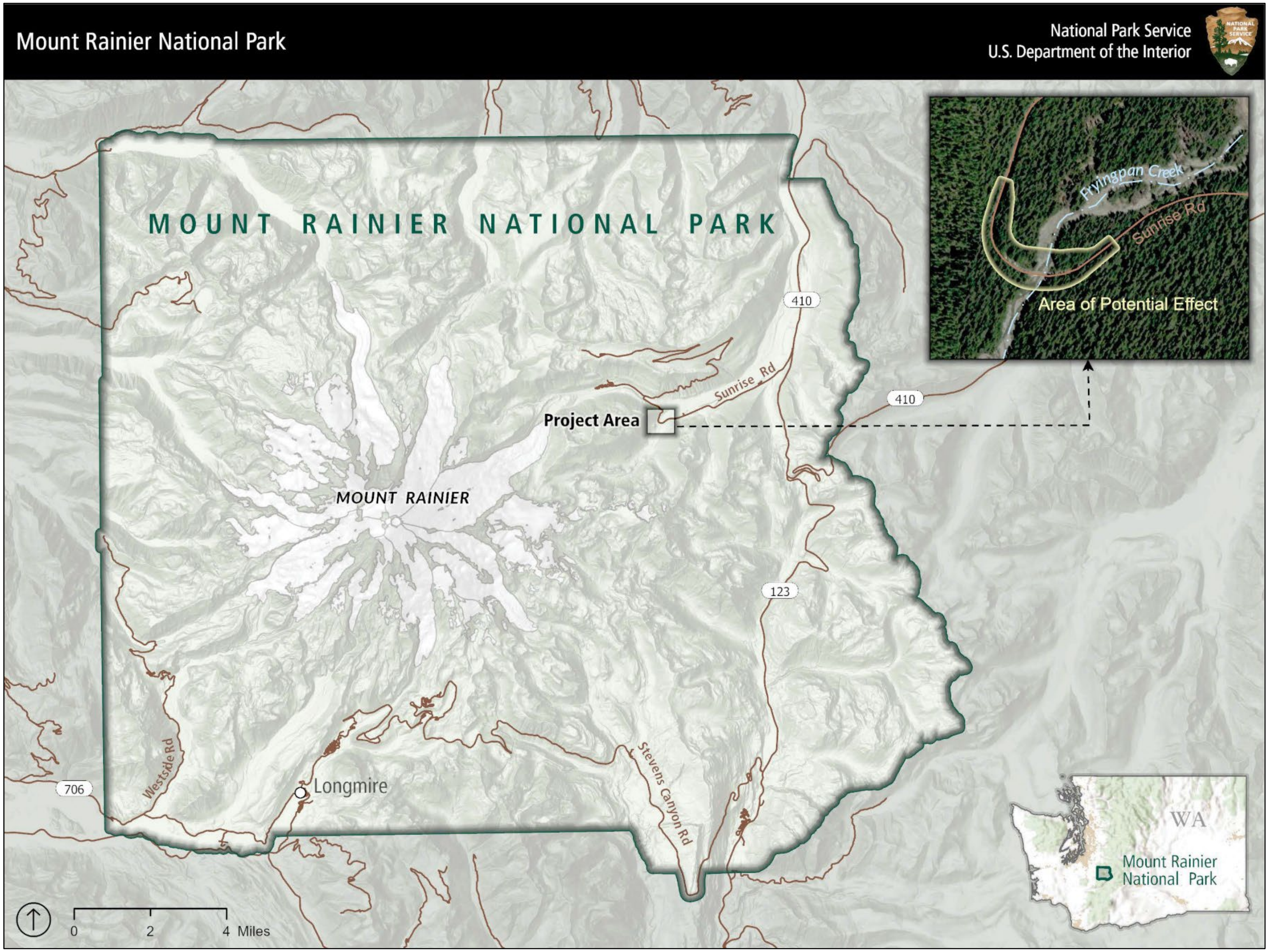
## Introduction

Mount Rainier National Park (the park) is in west-central Washington, on the western slope of the Cascade Range, and encompasses 236,381 acres within the authorized, legislated park boundary. An additional 140 acres lie outside the current boundary near the Carbon River entrance to the park. The park's northern boundary is approximately 65 miles southeast of the Seattle-Tacoma metropolitan area and 65 miles west of Yakima. The elevations in the park extend from about 1,700 feet above sea level to 14,410 feet at the summit of Mount Rainier. Most developed areas in the park are of national significance and are included in the comprehensive Mount Rainier National Historic Landmark District (NHLD), which was designated in 1997. The Mount Rainier NHLD sets the park apart as the best and most complete example of the conception and idea of an American national park, as embodied and implemented through National Park Service (NPS) master planning in the early 20th century.

The NPS, in cooperation with the Federal Highway Administration (FHWA), is proposing to replace the deteriorated Fryingpan Creek Bridge (pictured below). The project area (figure 1) is in the northeast corner of the park along Sunrise Road, about three miles west of the White River Entrance Station and at an elevation between 3,800 and 3,900 feet above sea level. Sunrise Road, historically named the Yakima Park Highway, is a 15-mile section of roadway that provides the only vehicular access from the Mather Memorial Parkway (Highway 410) to the White River and Sunrise areas of the park. The Sunrise Road alignment and Fryingpan Creek Bridge are contributing elements to the Mount Rainier NHLD.

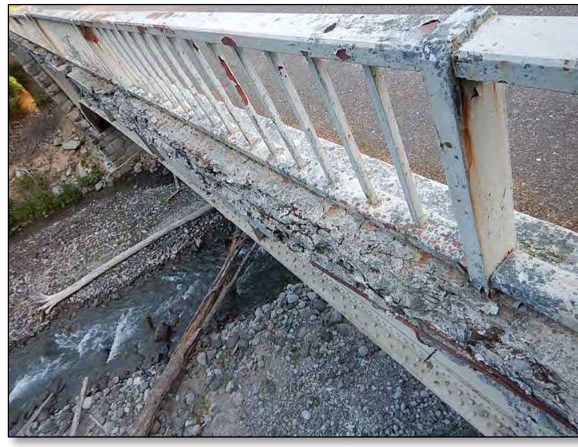
*Fryingpan Creek Bridge, NPS photograph 2021*

**Figure 1. Fryingpan Creek Bridge Project Area**



## Fryingpan Creek Bridge – History and Current Conditions

The Fryingpan Creek Bridge is a three-hinged steel arch bridge with two solid-web arch girders, the only one of its type in the park. The abutments and support walls are faced with native hewn stone. The final arch spans 128 feet, making it one of the longest in the park (NPS 2008). The existing roadway is 28 feet wide, and the overall width is 31 feet. See figure 2 for labeled photographs identifying key parts of the bridge and roadway. There is a parking area west of the bridge on the north side of the road with 15 pull-in parking spaces and informal parallel parking on the east and west sides of the bridge (figures 2 and 3).



*Severe spalling and exposed rebar on exterior face of curb, upstream side (FHWA 2020)*

The Fryingpan Creek Bridge was constructed in 1931 with a typical 75-year service life (which ended in 2006). The original vehicle design load was for a two-axle, 15-ton truck. The 2020 Bridge Inspection Report (FHWA 2020) concluded that the bridge is in poor condition overall, describing it as "seriously deficient or presents a safety hazard but can remain open at reduced loads or with frequent inspections." FHWA has identified the repair or replacement of the historic bridge as a major priority. The bridge has widespread cracking and spalling with exposed rebar on the deck underside, and the curbs are deteriorating. The existing steel beams have been painted with lead-based paint, which has started to fail and drop off into the surrounding environment, including the waters of Fryingpan Creek. The paint failure is also resulting in rusting of the structural steel. The bridge abutments, particularly the east abutment, are eroding due to their location in the creek channel, which makes the foundation susceptible to loss during major flood events and constricts water flow in Fryingpan Creek. Abutments are the substructures that support both ends of the bridge. Both abutments also have some undermining and deterioration of the abutment mortar joints.

*Rusting and corrosion of the floor and cross beams, underside of the bridge (FHWA 2020)*

*Undermining and spalling of the east bridge abutment (FHWA 2020)*

## Purpose of and Need for Action

The purpose of the proposed project is to replace the deteriorated Fryingpan Creek Bridge to ensure the bridge provides a structurally sound, long-term, vehicular bridge crossing over Fryingpan Creek. The Fryingpan Creek Bridge, which is part of the 15-mile Sunrise Road, is vital to park operations, local economies, and visitor use and enjoyment. Sunrise Road serves as the sole vehicular access to the popular Sunrise area (the second busiest area in the park) and is a primary destination for visitors coming from the greater Seattle and Yakima metropolitan areas. Sunrise Road also provides access to the White River Campground and popular park wilderness trails, including the historically significant Wonderland Trail. The proposed project would be designed and implemented to protect the park's important natural and cultural resources and to reduce long-term maintenance costs.

## Issues and Resource Topics Carried Forward for Detailed Analysis

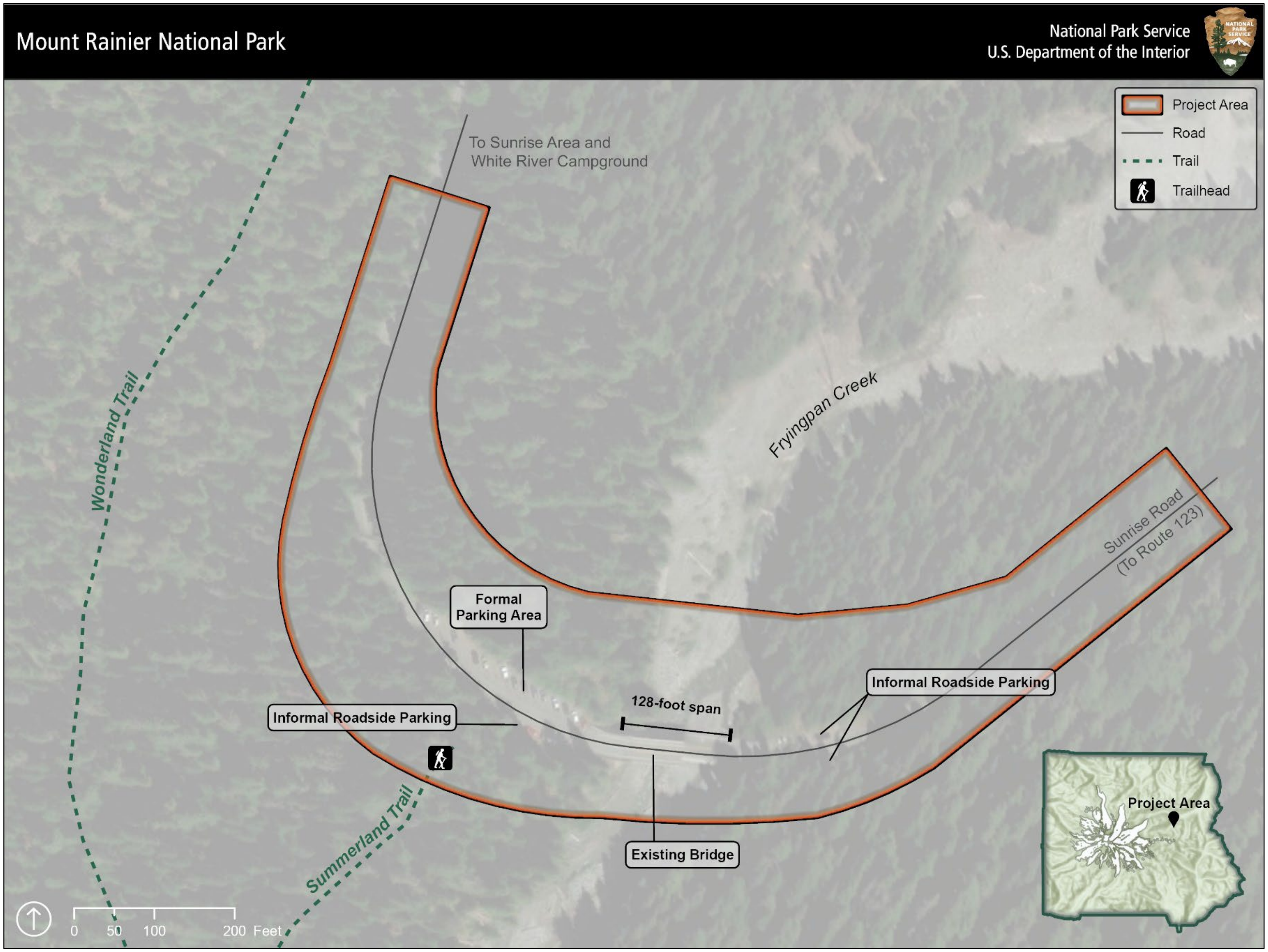
Impact topics for this proposed project have been identified based on federal laws, regulations, and executive orders; NPS *Management Policies 2006* and guidance; and NPS knowledge of the park's resources. Analyses in an environmental assessment (EA) focus on significant issues (meaning pivotal issues, or issues of critical importance) and only briefly discuss insignificant issues (40 Code of Federal Regulations [CFR] 1502.2(b)). Therefore, impact topics are considered carefully to determine which issues are analyzed in detail. Generally, issues should be retained for consideration and discussed in detail if:

- 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 among alternatives
- The environmental impacts associated with the issue are a big point of contention among the public or other agencies
- There are potentially significant impacts on resources associated with the issue

If none of the considerations above apply to an issue, the impact topic is dismissed from detailed analysis. The rationale for resource topics initially considered but dismissed is presented in appendix A.

**Figure 2. Photographs Showing Key Features in the Project Area**

**Figure 3. Current Conditions in the Project Area / Alternative A – No Action**



# CHAPTER 2: ALTERNATIVES

This chapter presents three alternatives for management of the Fryingpan Creek Bridge, the no-action alternative and two action alternatives that would replace the existing bridge. Alternative A, the no-action alternative, provides a baseline for comparing the impacts of continued maintenance of the existing bridge with the impacts of replacing the bridge under alternatives B and C. The action alternatives are alternative B/proposed action (new bridge on a new alignment downstream of the existing bridge) and alternative C (new bridge on the existing alignment). Alternative B has been identified as the NPS preferred alternative. These alternatives are summarized below. Resource protection measures are considered part of the action alternatives, and these are presented in appendix B. Following the descriptions of the alternatives are tables 1 and 2. Table 1 compares the main elements and differences among the three alternatives, and table 2 provides a summary of the construction activities for the two action alternatives and the sequencing of these activities. During development and consideration of the alternatives, the NPS also considered other alternatives that were dismissed due to unacceptable resource impacts, because they did not meet the purpose of and need for the project, or because they were outside of the scope of this project. These dismissed alternatives and the reason each was not carried forward for detailed analysis are summarized in appendix C.

## Alternative A – No Action

Current management of the Fryingpan Creek Bridge would continue under alternative A. Therefore, routine maintenance activities would continue, but no major repairs would be conducted. Current maintenance activities include:

- Routine road and parking area maintenance — This involves maintenance and repairs to asphalt and gravel surfaces, shoulders, pullouts, embankments, relief culverts, and ditches. Maintenance includes brushing, limbing, woody debris removal, and road resurfacing.
- Pavement marking/striping — Harsh winter conditions, snow removal operations, and visitor traffic degrade pavement markings, requiring annual in-kind restriping of roads and parking areas. Pavement marking requires warm temperatures and dry weather.
- Vegetation maintenance — Overgrown encroaching vegetation is trimmed, brushed, or mowed 15 to 30 feet from the pavement edge. Vegetation removal is needed to maintain drainage system function, increase sight distance for safety, and facilitate snow removal. Limbs, branches, and small trees up to 6 inches in diameter that have encroached on the road corridor are selectively cut and removed. Low hanging branches (below 14 feet off the ground) are trimmed to reduce the damage done to plow truck windshields. Woody debris and trimmings are collected and hauled away or chipped on site with chips thinly dispersed in place.
- Bridge maintenance — Bridge maintenance includes periodic cleaning and repointing of the masonry mortar joints in rock walls, cleaning and resealing of bridge deck joints, and replacing joint armor, as necessary. Other bridge maintenance actions include removing debris, cleaning and painting structural steel elements, replacing damaged decking, curbs and railing system components, and periodic replacement of riprap at the bridge abutments to prevent undermining.

The Fryingpan Creek Bridge is currently safe to drive on, and under alternative A, the bridge would continue to be inspected annually for safety. The bridge would also continue to be inspected after major flood events to confirm the maximum load that the foundation can support. Without structural and design corrections, however, roadway bridge deterioration would continue to escalate. It is reasonable to assume that the bridge could soon reach a state where loads, including emergency or firefighting vehicles, would be restricted. When this may occur depends on factors that are difficult to predict (e.g., storm events, progressive deterioration of structural elements). Closure of the bridge to vehicular use when it no longer meets bridge safety requirements would eliminate vehicular access for park operations and visitors. Possible future catastrophic failure of this bridge could occur and would result in closure of the road and loss of access to the Sunrise and White River areas and other recreational resources.

## Resource Protection Measures

To minimize resource impacts related to the action alternatives (alternatives B and C), the project would implement mitigation measures and best management practices (BMPs) whenever feasible. These resource protection measures are presented in appendix B. These protection measures are considered part of the alternatives, and they would be implemented to avoid or reduce impacts on park resources and values. The measures in appendix B are subject to the final design and approval of plans by relevant agencies.

## Alternative B (Proposed Action/Preferred Alternative) – New Bridge on a New Alignment Downstream of Existing Bridge

Under alternative B, a new longer permanent bridge would be constructed approximately 50 feet downstream from the existing bridge. The bridge would be approximately 220 feet long with a waterway opening of 207 feet from face-of-abutment to face-of-abutment on the new alignment (figures 4 and 5), allowing the bridge to span the 100-year floodplain. The new longer bridge and abutment locations would expand the channel migration zone and floodplain under the bridge crossing, which is currently constricted by the existing abutments. Construction activities to access, excavate, install, and remove existing and new bridge components would encroach into the active waterway.

The new bridge would be a single-span bridge constructed of steel and concrete with stone facing on portions of the bridge abutments. It would be 33 feet wide and have two 10-foot travel lanes with 2-foot-wide shoulders on each side. There would be one 5-foot-wide pedestrian sidewalk on the south (upstream) side with a 9-inch stone curb. This design would comply with Architectural Barriers Act (ABA) requirements for sidewalks. Railings would be installed on both sides of the bridge. The railing would be steel and would be designed for visibility through the railing for drivers and pedestrians.

The stone facing on the abutments of the existing bridge would be salvaged for the construction of stone masonry features on the new permanent bridge. On the new bridge, the walls extending from the end of the bridge along the road would be stone veneer. If there is not enough salvaged stone, then the top and inside of the walls would be veneer and the outside walls would be finished with form-lined concrete. The wing walls below the driving surface of the bridge would be form-lined concrete. The molds for the form-lined concrete would be shaped from the existing bridge to resemble the existing stone veneer. The bridge would be designed to ensure compatibility with the Mount Rainier NHLD to the greatest extent practicable.

Stone riprap would be placed at the base of the new bridge abutments to protect the abutments from scour and erosion. Although the proposed bridge length would allow for the bridge abutments to be placed completely outside the floodplain and the active Fryingpan Creek channel, the riprap would be placed adjacent to the channel for scour protection. Woody debris may be placed downstream of the riprap to reduce the energy of the flow and provide protection of the channel banks while also providing improved aquatic habitat within Fryingpan Creek.

**Figure 4. Alternative B (Proposed Action/Preferred Alternative) – New Bridge on a New Alignment Downstream of Existing Bridge**

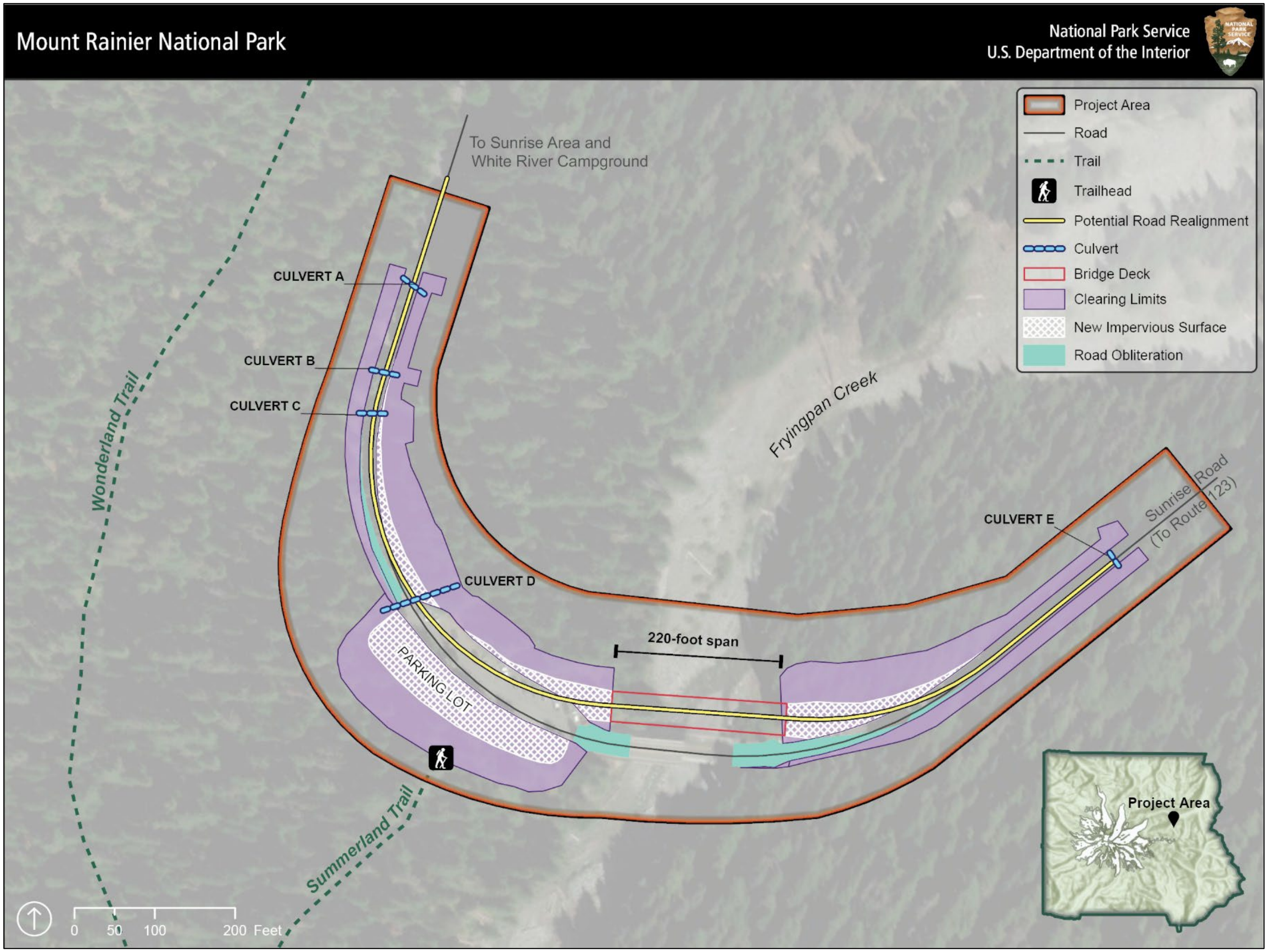
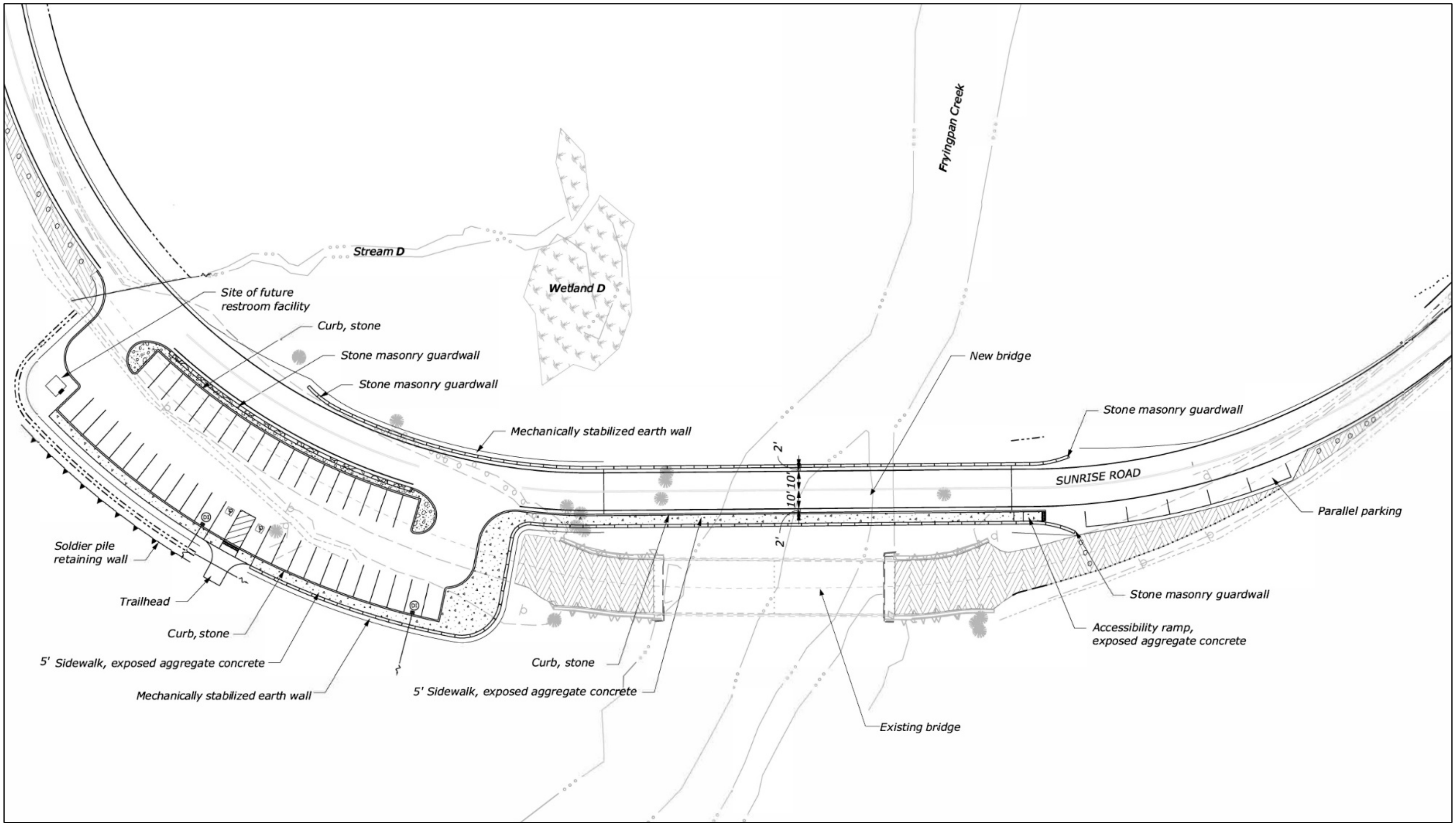


**Figure 5. Rendering of New Bridge under Alternative B/Proposed Action/Preferred Alternative – New Bridge on a New Alignment Downstream of Existing Bridge**

Note: This is a preliminary design drawing. Final design may be modified based on selected action and measures to avoid or meet site constraints and minimize impacts.



Building a new bridge slightly downstream would require changing the historic alignment of Sunrise Road at the east and west approaches to the bridge; however, the realigned portion of the roadway would be designed to blend into the existing roadway. Historic roadside rock barriers would be moved during construction and placed along the new road alignment when construction is complete.

The existing roadside parking area would be eliminated during the construction of the new alignment. A new trailhead parking area would be established on the west side of the bridge to provide consolidated parking that replaces existing parking. The new parking area would use part of the current road alignment and would also expand into the adjacent forest. The new parking area would be separated from the roadway, provide ABA-accessible sidewalks and parking spaces, and between 15 to 40 designated parking spaces. The new parking area would improve safety by removing parking spaces that require backing into the road and pedestrians would not need to cross the road to access the bridge or trailhead. The design shown in figure 5 may be modified to avoid or minimize impacts on park resources and to meet budget requirements. Informal parking along the roadway on the west side of the bridge would be eliminated. A retaining wall and an ABA-accessible sidewalk would surround the parking area. Other proposed improvements in this area include installing a restroom facility or vault toilet adjacent to the parking area and placing additional interpretive signs at the trailhead. On the east side of the bridge, a few parallel parking spaces would also be provided.

## Construction Activities

Construction activities for alternative B would be completed in three phases — preconstruction phase (geotechnical investigations and tree clearing), construction phase (bridge construction, existing bridge removal, roadway construction, parking area construction), and the post-construction phase (restoration and revegetation of disturbed areas). Appendix D lists the construction equipment that could be used during construction, demolition, and restoration activities, as well as the duration of use. After the pre-construction activities are complete, it is anticipated that alternative B would require two to three construction seasons to complete. The construction season for this area would occur during snow-free periods (spring, summer, and fall). Uncontrollable or unpredictable events, such as early fall snowstorms or unusually deep snowpacks in the spring, could shorten the construction season, which may result in a longer overall construction period for the project.

### *Preconstruction Phase*

Preconstruction work is planned to occur over two fall seasons. Geotechnical investigations (subsurface drilling) at the new alignment location would be done during the first season to obtain information on soil properties to refine the bridge abutment and retaining wall locations. The geotechnical investigation work would take approximately 10 weeks and would be scheduled between September (after Labor Day) and November. No more than 16 boreholes would be needed, eight on each side of the creek for the abutments. The total borehole depths are not known at this time but would not exceed 160 feet. Up to four additional boreholes would be needed in the proposed parking area. The boring equipment is estimated to have sound levels similar to that of other construction equipment (e.g., chainsaw, pneumatic tools), ranging from 84 to 85 decibels (dBA[1]) at a distance of 50 feet (FHWA 2006, 2017).

Sediment and erosion controls would be installed prior to the start of the geotechnical investigations. To provide a passable trail to the boring locations, a path would be cleared for the drill rig by removing vegetation and leveling uneven ground using a backhoe, tracked excavator, or bulldozer. After the investigation is complete, the area would be stabilized by re-contouring, and as appropriate, mulching

[1] A-weighted decibel, or dBA, is defined as the relative loudness of sounds as perceived by the human ear.

and/or seed-broadcasting the disturbed areas to prevent erosion. (Note, a more robust revegetation effort would be conducted after all construction activities are completed. See the "Postconstruction Phase" section below.)

During the second year, any remaining trees within the 2.3-acre clearing limits that were not removed for the geotechnical investigations would be removed between October 1 and March 14 (outside of the nesting season for northern spotted owl (*Strix occidentalis caurina*), marbled murrelet (*Brachyramphus marmoratus*), and birds protected under the Migratory Bird Treaty Act) to prepare for construction, which would begin the following spring. No more than 925 trees total would be removed. For trees between 18 inches and 40 inches diameter at breast height (DBH), 72 living trees and two dead trees would be removed. Six trees of DBH greater than 40 inches would also be removed. (See the "Soils and Vegetation" section in chapter 3 for more information on tree estimates.) Any hazard trees identified during construction would be removed following park management plans.

## Construction Phase

### Bridge Construction

During construction of the new bridge and roadway alignment, the existing Fryingpan Creek Bridge would be retained to allow for continued visitor and staff access to the Sunrise area; however, once construction of the new bridge is complete, the existing bridge and roadway would be removed and rehabilitated.

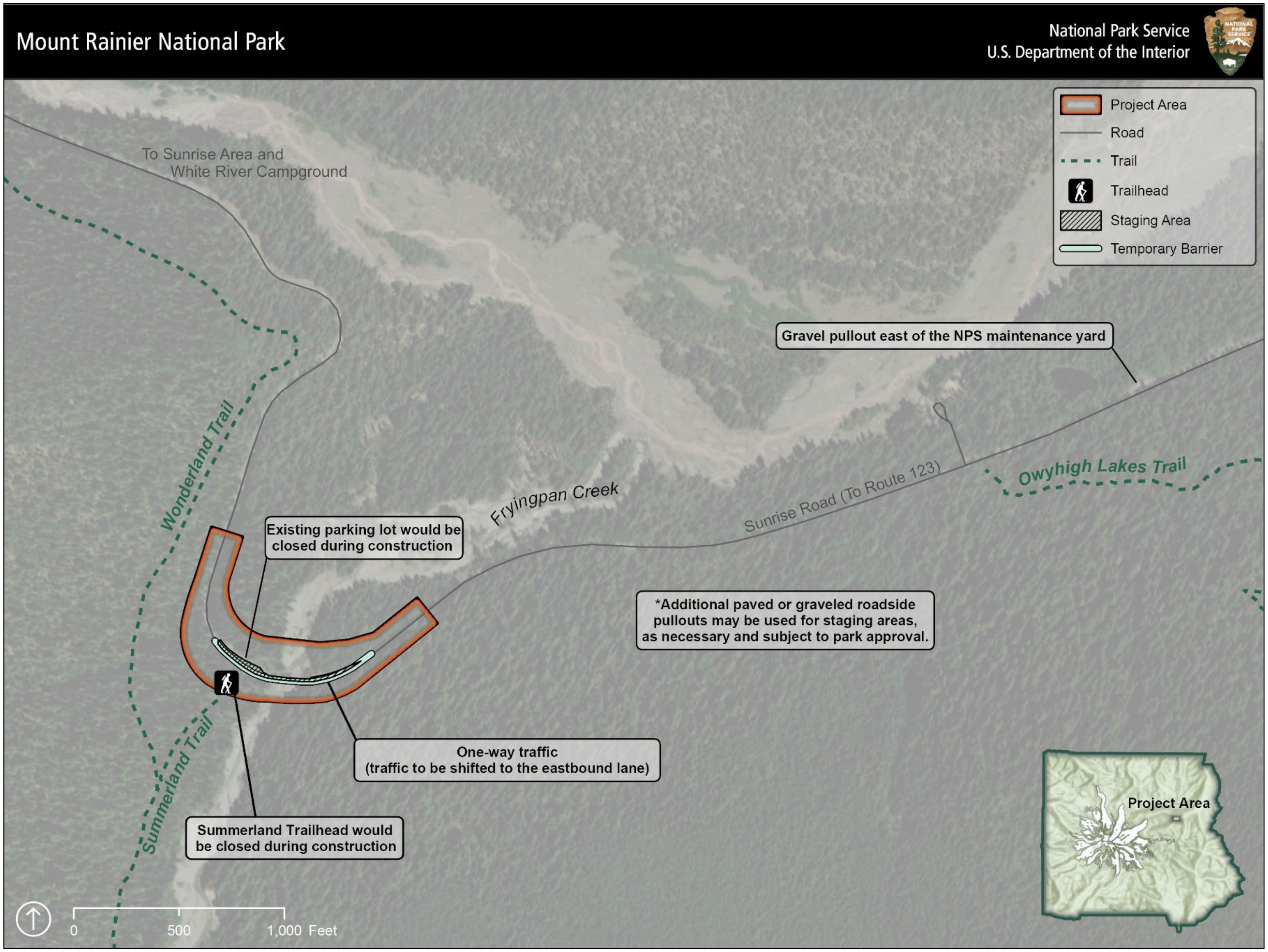
The construction of the new bridge would begin in the spring following completion of preconstruction activities. The bridge construction would include site preparation, construction of temporary supports for the new bridge, abutment construction, installation of steel girders, and bridge deck construction.

Site preparation would include installing additional sediment and erosion controls, staking the limits of the project area, and earthwork to remove remaining vegetation (shrubs and herbaceous vegetation) and bedrock. Following the site preparation, equipment and materials would be moved into designated staging areas, and traffic control mechanisms would be set up.

The existing Summerland Trailhead parking area, a gravel pullout just east of the NPS maintenance yard entrance, and one lane of Sunrise Road within the project area would be used for equipment staging areas and closed to public access (figure 6). Additional paved or graveled roadside pullouts may be used for staging areas, as necessary and subject to park approval. These additional staging areas would not occur at other trailheads (except for Summerland Trailhead). Access to the Summerland Trail, the spur trail to the Wonderland Trail from the Fryingpan Creek Bridge parking area, would be closed during bridge construction. Visitors would be directed to alternate trail access points to avoid the active construction area. The closest alternate access to the Wonderland Trail is the roadside access on Sunrise Road approximately 0.75 mile to the northwest of the Summerland Trailhead.

One lane of Sunrise Road would remain open during bridge construction via the existing roadway. Traffic delays of 20 to 30 minutes would be necessary during construction to accommodate one-way traffic. Short-term closures may be needed at additional times for site safety, including during the setting of bridge girders and blasting activity, if required. Temporary road closures for rock blasting are anticipated to be from a half an hour up to one hour in duration, two times per day, for a total of ten days. Additional closures may be authorized during the shoulder seasons (before Memorial Day and after Labor Day) if needed to minimize the overall number of years for project construction. If these closures are implemented, the park would inform the public and concessioners of delays and closures through various means and media.

**Figure 6. Staging Areas for Alternative B and Alternative C**



Blasting may be required due to shallow bedrock in the project area. Heavy equipment would be used to excavate and remove the bedrock to the maximum extent practical, but whatever cannot be completed with these methods would require blasting. The need for blasting would be determined based on results of geotechnical investigations; blasting would be minimized to the extent possible. It is anticipated that blasting would be primarily in the vicinity of the new bridge abutments and parking area expansion but could include other portions of the project area. Blasting would occur during early earthwork to access the bridge footings; therefore, it is likely that the blasting would occur in the first 30 days of earthwork. Preliminary blasting studies conducted for another project within the park found that at 230 feet from the blast site, the A-weighted peak sound level ($LA_{peak}$[2]) of a test blast measured 116.9 dBA (NPS 2021c); the same would be expected for blasting for the Fryingpan Creek Bridge project. Dense vegetation can reduce noise levels by as much as 5 decibels (dB) for every 100 feet of vegetation. Topography change can also reduce noise levels, and environmental factors, such as wind and water, can mask some of the construction noise (NRC 2012).

Timing is dependent on when project construction begins. Approximately two blasts per day are anticipated, for a total of up to ten blasts (this number would be further refined based on the results of the geotechnical investigations). Blasting would not occur in-water; however, some debris may be dislodged adjacent to Fryingpan Creek and inadvertently fall into the water. To reduce impacts, blast mats would be laid over the top of the shot to prevent flyrock and other debris and disperse some of the sound from the blast.

Any construction activities proposed below the ordinary high-water mark (OHWM) (referred to as "in-water work") of Fryingpan Creek would take place in work zone isolation areas. The OHWM is the line present on the shore established by the presence and action of water where the characteristics (e.g., soil, vegetation, presence of litter/debris) are visibly different from those of the upland area beyond it.

Temporary isolation work zones would be required to install piles to support temporary work platforms for bridge construction. Two work zones would be isolated with supersacks (heavy-duty bulk bags that would be placed to create a berm, see photograph to the right) and dewatered. A grouping of four temporary steel piles would be installed (via impact hammer) for each work zone. Once the above-water structure is constructed, the supersack berms would be removed and water would resume flowing around the piles throughout construction. This process would be repeated to deconstruct the platforms and remove the piles by crane.

Temporary isolation work zones would also be required for bridge abutment construction and demolition. To create a dewatered isolation work zone, a diversion berm would be constructed in the water around the proposed work sites using supersacks or a cofferdam placed via an excavator or similar heavy equipment. All diversion berms would be installed at the beginning of the in-water work window, as established through Endangered Species Act (ESA) Section 7 consultations to minimize impacts on affected species and removed before the in-water work window ends each season. The isolation zones would then be reinstalled again in the spring before construction begins. This would occur each year until construction is complete. At the end of the in-water work window, all equipment would be removed from the creek, and the diversion berms would be carefully disassembled. During berm removal, the work zones would be slowly rewatered and monitored to prevent sediment discharge. The only items to remain through the winter between construction seasons would be the bridge supports. Each temporary isolation work zone

[2] The $L_{peak}$, or peak sound level, is the true peak of the sound pressure wave. This is the maximum value reached by the sound pressure during a noise event. $LA_{peak}$ is the A-weighted peak sound level.

may require up to four creek crossings with tracked equipment (excavator or similar) before being dewatered.

Fish would be removed from work exclusion areas prior to dewatering or as it is slowly dewatered with methods such as hand or dip-nets, seining, or trapping, consistent with measures identified through the ESA Section 7 consultation process. Fish capture would be supervised by a qualified fisheries biologist with experience in work area isolation and competent to ensure the safe handling of all fish. Fish capture activities would be completed during periods of the day with the coolest air and water temperatures possible, normally early in the morning to minimize stress and injury of species present. Staff would install block nets above and below the project area and would conduct fish removal with seine and kick nets first, and then electrofishing if necessary. Electrofishing would not be conducted if naturally occurring high turbidity limits the visibility of fish. Electrofishing would be discontinued immediately if fish are killed or injured. Machine settings would be checked and adjusted for water temperature and conductivity as needed. If buckets are used to transport fish, staff would minimize the time fish are in a transport bucket. Buckets would be kept in shaded areas or covered with a canopy. Staff would limit the number of fish within a bucket and would ensure that fish are of a comparable size to minimize potential for predation. Aerators may be used, or water would be replaced in the buckets at least every 15 minutes with cold clear water. Staff would release fish in an area upstream with adequate cover and flow refuge. Downstream release may also occur if provided it is outside of the area influenced by construction activities. Water from within the isolation zone would be pumped and discharged to an upland location for infiltration to prevent turbid water from entering Fryingpan Creek.

Prior to the construction of the new bridge abutments, shoring (temporarily propping up) of the existing bridge may be required during excavation and construction. Shoring would keep the existing bridge stable and allow it to remain open to traffic during construction. Constructing new deeper foundation and bridge abutments (2 to 4 drilled

*Push-up cofferdam installation in a creek with high background turbidity levels (FHWA photo)*

*Supersack berm installation for in-water work (FHWA photo)*

*Example dewatered work zone area (FHWA photo)* shafts per abutment), placing concrete pile caps on top of drilled shafts, installing geotextile and riprap at base of abutments for scour protection, and demolishing the existing bridge foundations/abutments would occur within the isolation work zones. Upon completion of the abutments, the steel girders would be erected, and the bridge deck constructed.

Fryingpan Creek would flow in its channel around the work zones during construction to allow for aquatic organism passage and turbidity would be monitored. Work would be stopped if the turbidity exceeds the limits set by permitting requirements. Upon completion of the new bridge, the area around the new abutments would be rewatered and the water diversions would be removed. All work in the channel, including water diversion removal, would occur during the in-water work window.

***Roadway Construction Phase***

Roadway construction would include replacing the culverts, placing and compacting the road base, asphalt paving, line striping, and sign installation.

Within the project area, there are five culverts located along Sunrise Road that convey water under the road. These culverts would be replaced with larger culverts during roadway construction to improve site drainage. Culvert D west of Fryingpan Creek (see figure 4) is a stream-bearing feature and must be replaced during the project's established in-water work window. The remaining culverts (culverts A, B, C, and E; see figure 4) are cross culverts (carrying stormwater drainage only) and can be replaced at any time during construction. Although these five culverts are not fish bearing, they could provide aquatic organism passage. Because of this, exclusion and trapping would be conducted per state and federal guidelines, as applicable. With the exception of the work timing restrictions and aquatic species protections, culvert replacement would generally be the same for the five culverts in the project area. If flowing water is present, the culvert would be isolated and dewatered. This would require the installation of sandbag berms placed by hand or with the aid of tracked construction equipment operating from outside the stream. Sandbags would be filled with streambed/bank material from the work zone to limit the potential introduction or spread of invasive plants from outside sources. This material would be restored to its original location post-construction.

Once the berms are installed and the park has performed aquatic species trapping/relocation (if needed), the work zone would be dewatered and water from within the isolation zone would be pumped and discharged to an upland location for infiltration to prevent turbid water from entering the waterway. If flowing water is present, turbidity would be monitored. The asphalt would then be cut (if needed), the old culvert excavated and removed, and the new culvert installed. The historic headwalls associated with the culverts would be modified in accordance with the *Secretary of the Interior's Standards for Rehabilitation of Historic Properties* to accommodate the larger culverts and maintained or rebuilt to preserve these contributing elements to the historic Sunrise Road. The repair of culvert headwalls would be in kind and include repointing and resetting of stone, as needed. Repointing and resetting the stone would consist of relaying the original stone and completing masonry work, matching color, joint width, and orientation. Once work below the OHWM is complete in each location, the isolation work zones would be disassembled and slowly rewatered and monitored to prevent sediment discharge.

Approximately 930 feet of the existing curvilinear arrangement of the roadway would be realigned (340 feet on the east approach and 590 feet on the west approach). The roadway construction activities would include construction of supporting walls and slope stabilization, grubbing and grading the road corridor, placement of base materials for the road surface, road paving, and installation of guard walls. The project includes new asphalt surface matching the existing pavement width. Existing asphalt pavement and base material would be removed by a cold milling process, followed by sweeping. A course of recycled aggregate base using asphalt concrete pavement millings and recycled aggregate from the existing pavement structure would be placed and then compacted with a vibratory or compression roller. Asphalt concrete mix would be applied in lifts using typical paving equipment and rollers. The aggregate base would be improved where needed to allow for better roadway performance. The final steps would include striping the road lanes and installing signs.

After the new alignment is constructed, the old roadway approaches would be obliterated. Asphalt and other materials would be properly disposed of outside the park. This area would be recontoured and restored to match native ground to the extent practicable.

#### *Existing Bridge Removal*

After the new bridge and road alignment construction are completed, isolation work zones and debris containment zones would be established around the existing bridge abutments. It is estimated that the existing stone on the bridge is approximately two feet thick. Prior to removal of the stone, shoring of the existing abutment may be required to ensure that the abutment remains stable during stone removal. The existing bridge, including the steel and masonry, would be dismantled and material would be recycled or reused to the extent practicable. Excavation would be needed below the existing footings to remove the abutment. The holes in the stream would be backfilled and the area restored with naturally occurring stream material. The isolation work zones would be removed upon completion of the bridge removal. Water diversion would be removed, and the work zone rewatered. All work in the channel, including water diversion removal, would occur during the in-water work window.

#### *Trailhead Parking Area Construction*

The new parking area construction would be similar to the roadway construction. Following any required blasting, the area for the new parking would be grubbed and graded. Supporting walls and stabilizing slopes would be constructed, as appropriate to control runoff and erosion. A base material would be laid for the parking area surface. The guard walls guard rails, drainage, concrete curb, and sidewalks would be installed. The parking area would then be paved and striped, and signs installed. The parking area construction would also include work to install an accessible toilet facility and interpretive signs or seating areas, pending the final design. This work may be completed in phases based on site constraints and funding availability.

#### *Post-Construction Activities Phase*

After construction, disturbed areas would be restored and revegetated. The disturbed areas would be revegetated, using native materials and appropriate techniques. Boulders or other structures would be placed to prevent parking outside of designated parking areas. These boulders would be placed in similar locations and would have a similar look to the historic boulder alignments along the Sunrise Road corridor.

## Alternative C – New Bridge on the Existing Alignment

Under alternative C, a new wider and longer bridge would be constructed on the existing alignment (figures 7 and 8). The overall alignment of the new permanent bridge would match that of the existing bridge, but the new bridge would be wider (33 feet compared to 31 feet) and approximately 50 feet longer with a span of approximately 181 feet. The longer span would allow the new abutments to be placed further apart, meeting FHWA’s recommendation of a waterway opening of 170 feet (FHWA 2021). This longer span would reduce constriction of the waterway and limit floodplain disturbance. Due to the existing road alignment, the span cannot be made wide enough to completely remove the abutments from the floodplain at this location. Stone riprap would be placed at the base of the new bridge abutments to protect them from scour and erosion. The riprap would not be within the current active creek channel but would be in the floodplain. Approximately two-thirds of the riprap scour protection would be buried, and the remainder would be visible and remain exposed. Woody debris may be placed downstream of the riprap to reduce the energy of the flow and provide protection for the channel banks.

The new bridge would be similar in design, materials, and width to alternative B. The primary differences in the bridges in alternatives B and C would be length and alignment.

The finish stone veneer and form-lined concrete for the new bridge would be the same as described for alternative B. The new bridge would be designed to ensure compatibility with the Mount Rainier NHLD to the greatest extent practicable.

Unlike alternative B, the parking area would not be expanded and would remain on the downstream side of the road, opposite the Summerland Trailhead. The new bridge would have curved approach spans to match the existing alignment of the road. The longer and wider bridge on the existing alignment would result in the removal of approximately 2,500 square feet of pavement, resulting in the loss of up to six formal and non-formal parking spaces to accommodate the construction of the proposed wider and longer bridge on the existing road alignment. A portion of the existing parking area would be obliterated by the temporary access road during construction. Under this alternative, the historic roadside rock barriers would remain in place.

A temporary bridge and temporary road would be required during construction to retain access to the Sunrise area. This temporary bridge would not include the aesthetic treatments noted for the permanent bridge. The temporary bridge, for example, would not have stone veneer or mimic other historic features; however, these features would be included in the permanent new bridge on the existing alignment to allow the new bridge to blend into the existing historic landscape. The temporary bridge and the associated road alignment would be one lane. The temporary bridge would be removed once construction of the new bridge is complete. Following construction and demolition activities, all disturbed areas would be restored and revegetated with native plant species.

## Construction Activities

Construction activities for alternative C would be completed in three phases — preconstruction work, construction phase (including installation of temporary bridge, temporary road alignment, new bridge construction, temporary bridge demolition, roadway construction), and post-construction activities phase. As stated above, no new parking area would be constructed. Appendix D lists the construction equipment that could be used during construction, demolition, and restoration activities, as well as the duration of use.

It is anticipated that alternative C would require two to three construction seasons to complete and possibly longer. Some construction activities of alternative C must be sequential, not concurrent. For example, the new abutments on the existing alignment cannot be constructed until the old abutments are removed. Alternative C would involve more in-water work than alternative B. However, no new parking area would be constructed under alternative C, so depending on the snow-free periods during the construction years, the time frame for the two alternatives may be similar.

**Figure 7. Alternative C – New Bridge on the Existing Alignment**

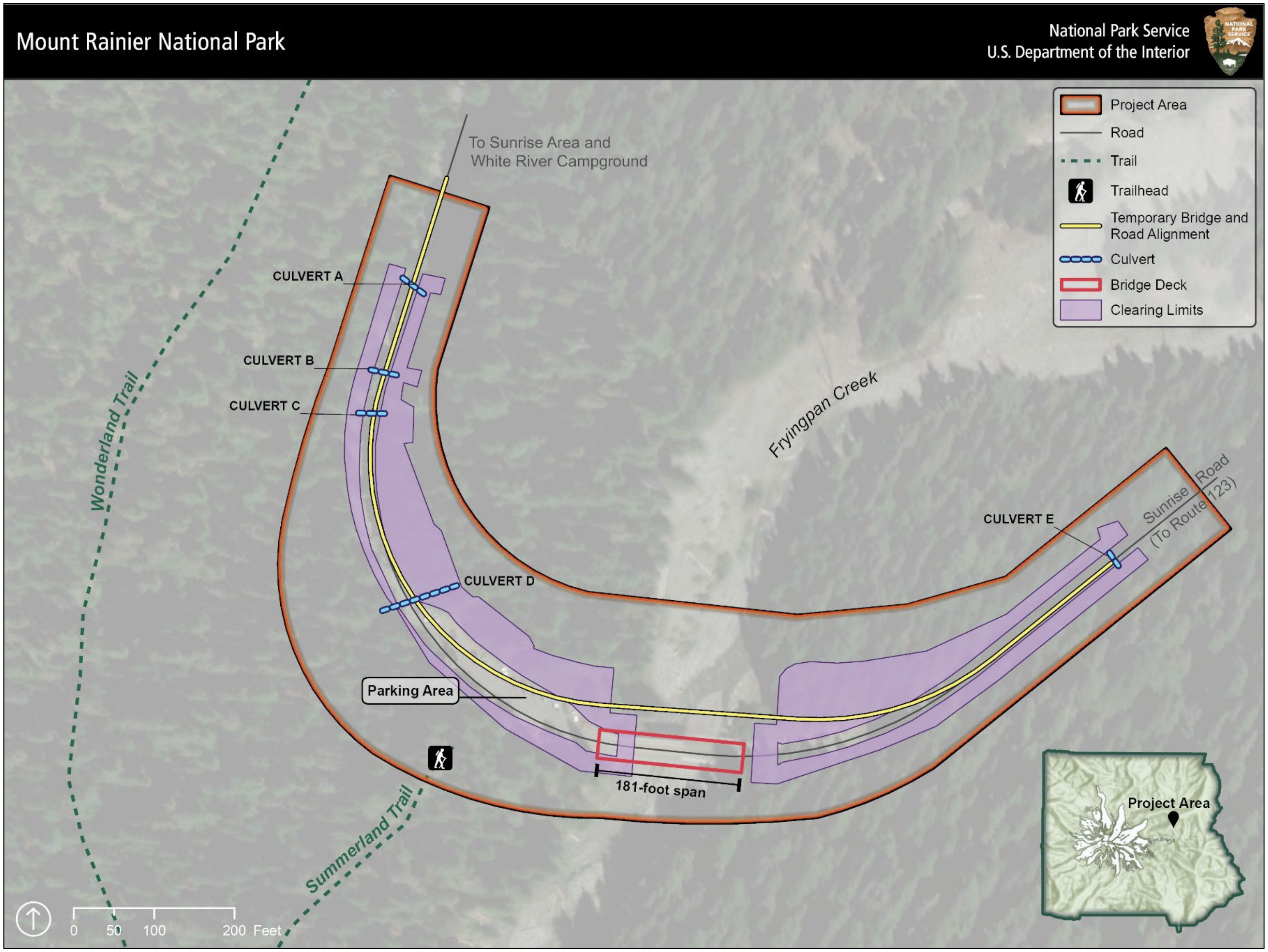
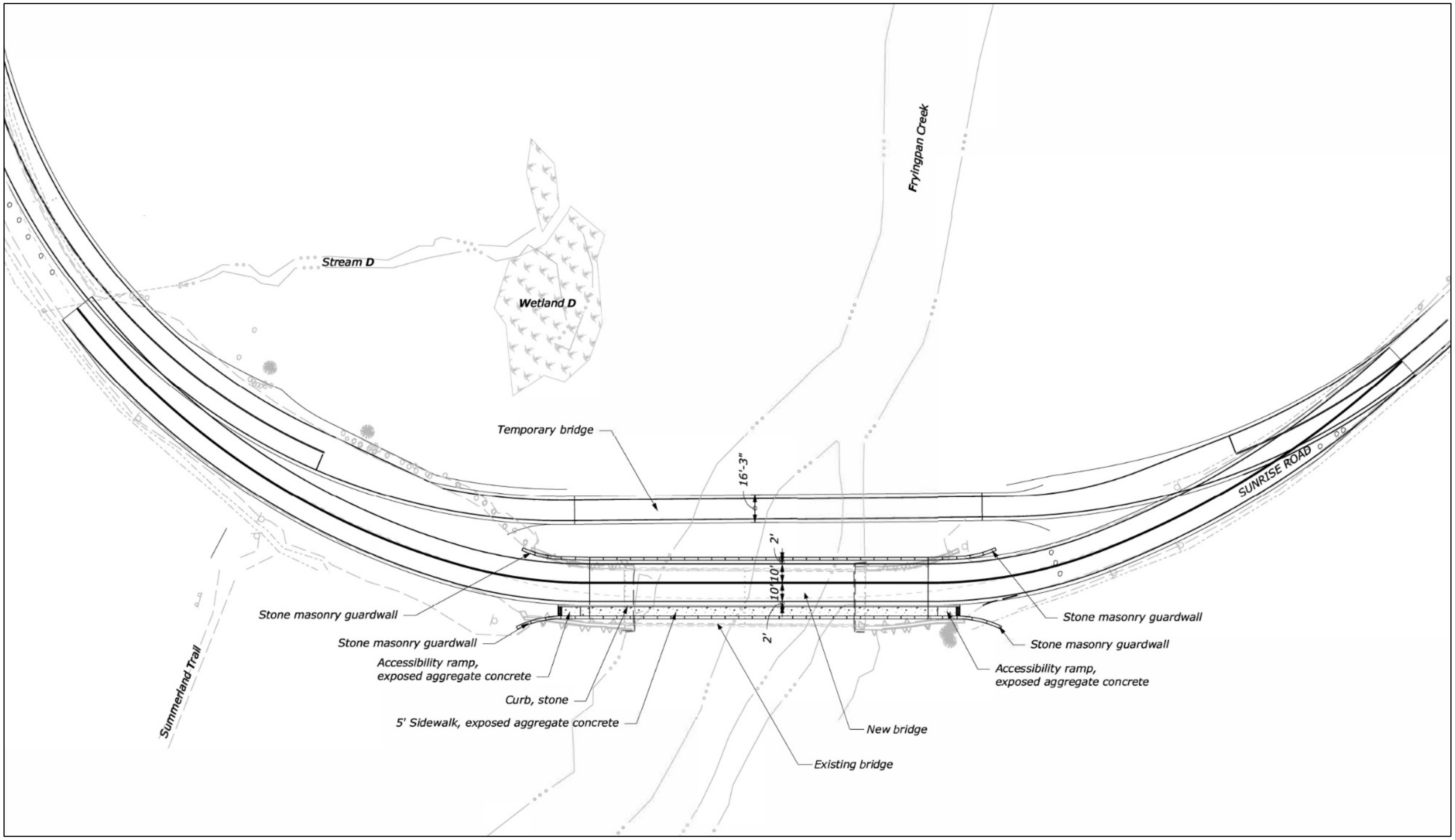


**Figure 8. Rendering of the New Bridge under Alternative C – New Bridge on the Existing Alignment**

Note: This is a preliminary design drawing. Final design may be modified based on selected action and measures to avoid or meet site constraints and minimize impacts.



### *Preconstruction Activities Phase*

Preconstruction work is planned to occur over two fall seasons. The preconstruction activities would be similar to those described under alternative B. The geotechnical investigation work would be completed during the first season, including clearing a path for the drill rig, and the remainder of the trees within the clearing limits would be removed during the second year. However, the number of trees is estimated to be less. Trees would be removed from the 1.8-acre clearing limits that were not removed during the geotechnical investigation. It is estimated that no more than 690 trees would be removed over the two preconstruction phases. Of those trees, 54 are between 18 and 40 inches DBH, and five that are greater than 40 inches DBH.

### *Construction Phase*

#### *Bridge Construction*

Under alternative C, the temporary bridge and road alignment would have to be constructed before the work to replace the existing bridge could begin. The construction of the temporary bridge would begin in the spring following completion of pre-construction activities and take about 6 weeks. The rest of the construction activities — site preparation, removal of the existing bridge, construction of the new bridge, and removal of the temporary bridge — would take two to three years or more after the temporary bridge is constructed. Construction would occur during snow-free periods (spring, summer, and fall). Some of these actions would be similar or the same as described under alternative B. Differences are described below.

Site preparation (installing additional sediment and erosion controls, staking the limits of the project area, and earthwork to remove remaining vegetation and bedrock) would be similar to that described for alternative B; however, the excavation would be for the temporary bridge on the downstream alignment.

Staging areas would also be the same as described under alternative B. The Summerland Trailhead and parking area would be closed during bridge construction. The Summerland Trail would remain open through construction via alternate trail access points.

One lane of Sunrise Road would remain open during construction of the temporary bridge and road. Traffic delays and short-term closures would be the same as described under alternative B.

Blasting may be required due to shallow bedrock in the project area. This work would be primarily in the vicinity of the temporary bridge alignment. Blasting would be similar to the activities described under alternative B. It is expected that fewer blasts would be required under alternative C because this alternative does not include a new parking area.

Unlike alternative B, where isolation work zones would only be required for the new bridge and to demolish the old bridge, alternative C would require isolation work zones for pile installation to support the construction of both the temporary and new bridges, as well as for the demolition of the existing bridge abutments and new bridge abutment construction. Once the above-water structure is constructed, the supersack berms would be disassembled and water would resume flowing around the piles throughout construction. All work in the channel, including water diversion removal, would occur during the in-water work window.

**Temporary Bridge Construction.** Temporary supports would be constructed in the river channel to support the temporary bridge. Prior to the construction of the temporary bridge, shoring of the existing bridge may be required during excavation and construction. Shoring would keep the existing bridge stable during construction of the temporary bridge. The temporary bridge would be a prefabricated/modular-type bridge. It would be manufactured off-site and transported to the site in 15-foot sections. The temporary bridge would adhere to legal loads with no posted restrictions. The bridge would be installed by crane on the temporary supports. The temporary bridge would be installed prior to work on the permanent bridge.

**Temporary Road Alignment.** The construction of the one-lane temporary road alignment would include grubbing, excavating and grading the road corridor, placement of base materials for the road surface, paving the road, striping the road lanes, and installing signs. Upon completion, the traffic would be shifted to the new temporary bridge and road alignment during construction of the new permanent bridge.

**Existing Bridge Removal.** After the temporary bridge construction is completed, the existing bridge would be removed, as described for alternative B.

**New Bridge Construction.** Following the removal of the existing bridge, the new bridge would be constructed on the existing alignment. The abutments would be constructed as described under alternative B. Within the isolation work zones, the new bridge abutments (2 to 4 drilled shafts per abutment) would be constructed, concrete pile caps would be placed on top of drilled shafts, and geotextile and riprap would be installed at the base of the abutments for scour protection. Upon completion of the abutments, the steel girders would be erected, and the bridge deck constructed.

*A portion of a temporary prefabricated bridge (FHWA photo)*

### *Roadway Construction*

Roadway construction and culvert replacement would be the same as described under alternative B, although the parking area supporting wall would not be constructed.

### *Temporary Bridge and Road Removal*

After construction of the new bridge, the isolation work zones and debris containment would be reestablished around the temporary bridge supports. The existing temporary bridge would be dismantled and removed from the site by crane. The temporary roadway would also be obliterated. Asphalt and other materials would be properly disposed of outside the park. This area would be recontoured and restored to match native ground to the extent practicable.

### *Trailhead Parking Area Construction*

The formal parking area would be re-established by repaving the area and striping parking spaces. However, as stated previously, up to six formal and non-formal spaces would be removed to accommodate the new bridge.

### *Post-Construction Activities Phase*

After construction, disturbed areas would be restored and revegetated. Boulders, if moved, would be replaced in their original locations. The disturbed areas would be revegetated, as appropriate.

## Alternatives Considered but Dismissed

The NPS and FHWA developed several preliminary alternatives early in the planning process that were not carried forward for further analysis for the following reasons:

- technical or economic infeasibility
- inability to resolve the purpose and need for taking action
- duplication with other, less environmentally harmful, or less expensive alternatives

The alternatives that were considered but dismissed are summarized in appendix C.

**Table 1. Comparison of Alternatives A, B, and C Bridge Design Elements**

| Action | Alternative A | Alternative B (Proposed Action/ Preferred Alternative) | Alternative C |
|---|---|---|---|
| Bridge width (feet) | 31 | 33 | 33 |
| Span across Fryingpan Creek (feet) | 128 | 220 | 181 |
| Bridge abutments located outside the floodplain | No | Yes | No[1] |
| Retains historic bridge | Yes | No | No |
| Retains historic alignment | Yes | No | Yes |
| Retains historic views from road corridor | Yes | No | Yes |
| Sidewalk width | N/A | 5 feet | 5 feet |
| Shoulder width | 3 feet | 2 feet | 2 feet |
| Travel lane width | 11 feet | 10 feet | 10 feet |
| Trailhead parking area improvements | No | Yes | No |
| Approximate number of designated parking spaces | 15 | 15 to 40[2] | 9 |
| Accessible parking spaces | 0 | 2 | 1 |
| Requires a temporary bridge | No | No | Yes |
| Acres of vegetation clearing limits | 0 | 2.3 | 1.8 |
| Acres of temporary vegetation loss | 0 | 1.7 | 1.8 |
| Acres of permanent vegetation loss | 0 | 0.6 | 0 |
| Repair lifespan estimate | Unknown[3] | 75 to 100 years | 50 to 75 years[4] |
| Reduces maintenance frequency and cost | No | Yes | Yes |

1 - Would reduce waterway constriction and minimize floodplain disturbance, but not completely outside the floodplain
2 – Estimate only, pending final design and site constraints
3 - Bridge to be inspected annually, may impose weight limits. Does not resolve findings in bridge inspection report and does not meet purpose and need.
4 - Could be less due to erosion because abutments are still in the floodplain

**Table 2. Construction Steps and Sequence – Comparison of Alternatives B and C**

Table 2 provides a summary of the construction activities for the two action alternatives — alternatives B and C — and the sequencing of these activities. The construction phases are illustrated in the graphic below. Because the steps taken during construction under the two alternatives are similar, table 2 identifies elements where the alternatives differ from each other with bold text. Text in italics indicates in-water work.

| Pre-construction | | Construction | | | Post-construction |
|---|---|---|---|---|---|
| Year 1 | Year 2 | Year 1 | Year 2 | Year 3 | Year 1 plus post-monitoring, as needed |

| Construction Activity | Alternative B (Proposed Action/Preferred Alternative) | | Alternative C | |
|---|---|---|---|---|
| | Details | Construction Phase | Details | Construction Phase |
| Geotechnical Investigation | • Conduct nesting bird survey<br>• Install sediment and erosion controls<br>• Clear a path for drill rig access, including removal of select large trees, vegetation, and uneven ground<br>• Conduct geotechnical drilling (up to 16 boreholes for the abutments and **4 for the parking area**)<br>• Stabilize disturbed area | • Preconstruction year 1<br>• September to November (or until snowfall)<br>• Tree removal after Labor Day | • Conduct nesting bird survey<br>• Install sediment and erosion controls<br>• Clear a path for drill rig access, including removal of select large trees, vegetation, and uneven ground<br>• Conduct geotechnical drilling (up to 16 boreholes for the abutments)<br>• Stabilize disturbed area | • Same as alternative B |
| Tree Removal within Construction Limits[1] | • Remove remaining trees within the **2.3-acre clearing limits** that were not removed during the geotechnical investigation<br>– **No more than 925 trees total (approximately 922 living trees total – 72 between 18 and 40 inches DBH, 6 greater than 40 inches DBH; two additional dead trees between 18 and 40 inches DBH)** | • Preconstruction year 2<br>• Between October 1 and March 14 | • Remove remaining trees within the **1.8-acre clearing limits** that were not removed during the geotechnical investigation<br>– **No more than 690 trees total (54 are between 18 and 40 inches DBH and five are greater than 40 inches DBH)** | • Same as alternative B |

| Construction Activity | Alternative B (Proposed Action/Preferred Alternative) | | Alternative C | |
|---|---|---|---|---|
| | **Details** | **Construction Phase** | **Details** | **Construction Phase** |
| Site Preparation and Vegetation Removal | • Install sediment and erosion controls and stake project limits<br>• Remove remaining vegetation as needed within the **2.3-acre clearing limits** | • Construction year 1<br>• Duration of construction season (snow-free periods - spring, summer, and fall) | • Install sediment and erosion controls and stake project limits<br>• Remove remaining vegetation as needed within the **1.8-acre clearing limits** | • Construction year 1<br>• Duration of construction season |
| Mobilization and Staging | • Mobilize equipment to the site<br>• Set up traffic control for lane closures (staging area)<br>• Stage equipment and materials in designated staging areas | • Each construction year<br>• Beginning of each construction season | • Same as alternative B | • Same as alternative B |
| Access – Pioneering Earthwork | • Complete grubbing within the **2.3-acre clearing limits**<br>• Perform excavation to build road to **new bridge** location<br>• Mechanically remove exposed bedrock to the maximum extent possible<br>• Use blasting techniques to remove remaining bedrock outcrops if needed for the abutments **and parking area** | • Construction year 1<br>• Duration of construction season<br>• Blasting, if needed, would occur during the in-water work window[2] | • Complete grubbing within the **1.8-acre clearing limits** for temporary road and bridge<br>• Perform excavation to build **temporary road and temporary bridge**<br>• Mechanically remove exposed bedrock to the maximum extent possible<br>• Use blasting techniques to remove remaining bedrock outcrops if needed for the abutments | • Same as alternative B |
| Access – Construct Temporary Bridge Supports for New or Temporary Bridge | • *Install temporary diversions and isolation work zones*<br>• *Install temporary shoring to stabilize existing bridge abutments during in-water construction*<br>• **Install temporary piles in dewatered work zones**<br>• **Construct temporary work platforms on piles**<br>• *Rewater work zone around temporary bridge supports and remove water diversions* | • Construction year 1<br>• During in-water work window | • *Install temporary diversions and isolation work zones*<br>• *Install temporary shoring to stabilize existing bridge abutments during in-water construction*<br>• **Construct temporary support for temporary bridge (abutments are outside OHWM)**<br>• *Rewater work zone around temporary bridge supports and remove water diversions* | • Same as alternative B |

| Construction Activity | Alternative B (Proposed Action/Preferred Alternative) | | Alternative C | |
|---|---|---|---|---|
| | Details | Construction Phase | Details | Construction Phase |
| Bridge Construction | • **Construct new bridge on new alignment**<br>– **Construct drilled shafts (2 to 4 per abutment)**<br>– **Install concrete pile cap on top of the drilled shafts**<br>– **Construct new bridge abutments (abutments are outside OHWM)**<br>– **Install riprap armoring – approximately two thirds would be buried and one third exposed**<br>– **Erect steel girders and construct bridge deck** | • **Construction (multiple years)**<br>• **Duration of construction season**<br>• Water work during the in-water work window | • **Transport and install ready-to-use temporary bridge by crane on temporary alignment** | • **Construction (5 weeks estimate)**<br>• **No in-water work** |
| Roadway Construction Phase 1 | • Remove asphalt, as needed<br>• *Replace/install new culverts*<br>– *Install diversions, if needed*<br>– *Cut and remove asphalt, as needed*<br>– *Remove/replace/install culverts and headwalls along new alignment section, subject to final design and permitting*<br>– *Remove diversion and rewater*<br>• **Excavate and build embankment for road**<br>• **Construct new supporting walls and stabilize slopes** | • Construction<br>• Duration of construction season<br>• In-water culvert work during the in-water work window<br>• Would need to occur before existing bridge can be dismantled | • See below | • Occurs later in sequencing |

| Construction Activity | Alternative B (Proposed Action/Preferred Alternative) | | Alternative C | |
|---|---|---|---|---|
| | **Details** | **Construction Phase** | **Details** | **Construction Phase** |
| Roadway Construction Phase 2 | • Place and compact road base **on new alignment**<br>• Asphalt paving o**n new alignment, approximately 340 feet long on east side of bridge and 590 feet on west side of bridge**<br>• Conduct asphalt milling - the portion of the existing roadway where the new alignment ties into the existing road; the limits of this milling go to the first and last culvert replacements<br>• Excavate roadway<br>• *Replace remaining culverts along existing alignment further from bridge*<br>• Install guard walls<br>• Install aggregate base<br>• Conduct asphalt paving | • Construction<br>• Duration of construction season<br>• In-water culvert work during the in-water work window | • See below | • Occurs later in sequencing |
| Temporary Roadway Construction | • N/A | • N/A | • **Excavate and build embankment for temporary road**<br>• **Place and compact road base**<br>• **Place asphalt**<br>• **Pave and stripe temporary road, install temporary signs**<br>• **Shift traffic to temporary road/bridge** | • **Construction** |

| Construction Activity | Alternative B (Proposed Action/Preferred Alternative) | | Alternative C | |
|---|---|---|---|---|
| | Details | Construction Phase | Details | Construction Phase |
| Existing Bridge Removal | • *Set up isolation work zones around existing bridge footings*<br>• Install debris containment<br>• Salvage masonry<br>• *Install temporary shoring to stabilize existing bridge abutments after stone removal during in-water construction*<br>• Dismantle and dispose of bridge<br>• *Excavate below the existing footings to remove the abutment*<br>• *Backfill holes and restore area with appropriately sized stream material*<br>• *Perform site restoration*<br>• *Rewater work zone/remove water diversions* | • Construction, following completion of **new** bridge<br>• During in-water work window | • Same as alternative B | • Construction, following completion of **temporary** bridge<br>• During in-water work window |
| New Bridge Construction on Existing Alignment | • N/A | • N/A | • **Construct bridge abutments (abutments are outside OHWM)**<br>• **Construct drilled shafts (2 to 4 per abutment)**<br>• **Install concrete pile cap on top of the drilled shafts**<br>• ***Install riprap armoring (potentially in-water work)***<br>• **Erect steel girders and construct bridge deck** | • **Construction (Multi-year)**<br>• **Duration of construction season In-water work during the in-water work window** |

| Construction Activity | Alternative B (Proposed Action/Preferred Alternative) | | Alternative C | |
|---|---|---|---|---|
| | **Details** | **Construction Phase** | **Details** | **Construction Phase** |
| Permanent Roadway Construction Phase 1 | • See above | • Occurred earlier in sequence | • Remove asphalt, as needed<br>• *Replace/install new culverts*<br>– *Install diversions, if needed*<br>– Cut and remove asphalt, as needed<br>– *Remove/replace/install culverts and headwalls along new alignment section, subject to final design and permitting*<br>– *Remove diversion and rewater*<br>• **Place and compact road base**<br>• **New asphalt surface, as needed, on existing road** | • Construction<br>• Duration of construction season<br>• In-water culvert work during the in-water work window |
| Permanent Roadway Construction Phase 2 | • See above | • Occurred earlier in sequence | • Place and compact road base **on current alignment**<br>• Asphalt paving **on current alignment**<br>• Conduct asphalt milling - the portion of the existing roadway where the new bridge ties into the existing alignment to match elevations<br>• Excavate roadway<br>• *Replace remaining culverts along existing alignment further from bridge*<br>• Install guard walls<br>• Install aggregate base<br>• Conduct asphalt paving | • Construction<br>• Duration of construction season<br>• In-water culvert work during the in-water work window |

| Construction Activity | Alternative B (Proposed Action/Preferred Alternative) | | Alternative C | |
|---|---|---|---|---|
| | Details | Construction Phase | Details | Construction Phase |
| Temporary Bridge Removal | • N/A | • N/A | • **Install debris containment**<br>• **Remove the bridge by crane**<br>• ***Excavate below the existing footings to remove the temporary support***<br>• ***Conduct site restoration***<br>• ***Backfill holes and restore area with appropriately sized stream material***<br>• ***Rewater work zone/remove water diversions*** | • **During in-water work window** |
| Roadway Removal | • Decommission approaches and obliterate **old** roadway<br>• Recontour and restore to match native ground | • Construction<br>• **Post-Bridge Construction** | • Decommission approaches and obliterate **temporary** roadway<br>• Recontour and restore to match native ground | • Construction<br>• **Removal of temporary roadway would occur after new bridge and road is complete and open for use** |
| Trailhead Parking Area Construction | • Pending final design<br>• Install drainage<br>• Conduct excavation and build embankment<br>• Install retaining walls, curb/sidewalk, and guard wall<br>• Place and compact parking area base<br>• Conduct asphalt paving | • Construction – once area is no longer needed for bridge construction staging<br>• Duration of construction season | • Reestablish and pave parking preexisting spaces | • Construction– once area is no longer needed for bridge construction staging<br>• Duration of construction season |
| Stripe and Install Signs | • Stripe and install signs for final roadway and **new parking area**<br>• Shift traffic to new road/bridge | • **Final year of construction following completion of final road and parking area paving**<br>• Duration of construction season | • Stripe and install signs for final roadway and **reduced parking area**<br>• Shift traffic to new bridge on existing alignment | • Same as alternative B |

| Construction Activity | Alternative B (Proposed Action/Preferred Alternative) | | Alternative C | |
|---|---|---|---|---|
| | Details | Construction Phase | Details | Construction Phase |
| Site Restoration | • Revegetate **1.7 acres**, as appropriate<br>• **0.6 acres** of permanent vegetation loss **(in area of new road alignment, bridge approach and parking area)** | • Duration of construction season | • Revegetate **1.8 acres**, as appropriate<br>• **0 acres** of permanent vegetation loss | • Same as alternative B |
| Revegetation (throughout as needed, final revegetation) | • Hydroseed disturbed areas, as needed<br>• Plant wetland species per the NPS-approved revegetation plan<br>• Monitor site to ensure revegetation efforts are succeeding and invasive plants are not becoming established or spreading in disturbed areas<br>• Place boulders | • Post-construction<br>• Duration of construction season | • Same as alternative B | • Same as alternative B |
| Final Project Clean-up | • Return to normal administrative and public access | • Final step of post-construction | • Same as alternative B | • Same as alternative B |

Text in **bold** indicates differences between alternatives B and C
Text in *italics* indicates in-water work
1 – DBH = diameter at breast height. Estimates are based on inventory within the project area that was available in July 2022
2 – The in-water work is defined as "any activity below the ordinary high-water mark (OHWM)." These activities would be conducted during the in-water work window determined through ESA consultation.

# CHAPTER 3: AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

## General Methods for Analyzing Impacts

This chapter describes the existing conditions and the environmental consequences of resources retained for analysis that could be impacted by implementing the alternatives. The affected environment discussion for each resource precedes the impact analysis and describes the baseline conditions within the project area. The resources described in this chapter are soils and vegetation, wetlands, floodplains, special status species, cultural landscapes and historic structures, and visitor use and experience. This chapter is organized by resource topic so that the alternatives can be compared to each other.

The resource protection measures described in appendix B are considered part of the alternatives. Where appropriate, mitigation measures and/or BMPs for adverse impacts are also described and incorporated into the evaluation of impacts. As noted in appendix B, the design of the new bridge and parking area may be refined from what is presented in this document; however, the discussions of impacts on park resources in this chapter represent the upper limit of impacts that would occur. Any modifications to the design would reduce or avoid impacts on park resources.

The impact analyses and conclusions are generally based on a review of existing literature, studies, and research performed by park staff, information provided by experts within the NPS, FHWA, and other agencies and institutions, professional judgment, park staff expertise and insights, and public input.

## Scenario for Cumulative Impact Analysis

Cumulative impacts are defined as "effects on the environment that result from the incremental effects of the action when added to the effects of other past, present, and reasonably foreseeable actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR 1508.1(g)(3)). To determine potential cumulative impacts, past, present, and reasonably foreseeable actions and land uses were identified in or near the project area. The projects considered in the cumulative effects analysis are presented in appendix E. Cumulative impacts are considered for the three alternatives.

## Soils and Vegetation

### Affected Environment

#### *Soils*

Three soil map units occur within the project area — Riverwash-Flett complex (0 to 25% slopes), Longmire-Laughingwater-Vantrump complex (5 to 65% slopes), and Longmire-Arahustan-Vantrump complex (20 to 65% slopes) (figure 9; NRCS 2021). The Longmire-Laughingwater-Vantrump and Longmire-Arahustan-Vantrump complexes are mapped on the east-facing and northwest-facing slopes east of Fryingpan Creek, respectively. These soils are developed in volcanic ash over colluvium derived from andesite on glacial valley walls and debris aprons and support coniferous forests (NRCS 2021). Colluvial soils are rapidly drained and consist of coarse, unconsolidated, mixed parent materials. These soils are found on slopes at all elevations (Graham 2005). Some rocky outcrops are visible within the project area; these areas would be further characterized during the geotechnical investigations. The Riverwash-Flett complex occurs within floodplains and terraces. Flooding within this complex ranges from rare to frequent but brief (NRCS 2021). Alluvial soils such as these occur in major river valleys, along streams, wet benches, and alluvial slopes and fans. They consist of coarse undifferentiated fine or very fine sands. Alluvial deposits are of varying thickness and texture (NPS 2010).

**Environmental Trends.** The soils in the roadside areas have been disturbed by human activities, such as construction and maintenance of the road, cars moving off the pavement onto the unpaved shoulder while driving and for parking, and compaction from park visitors walking along the sides of the road near the bridge and the Summerland Trailhead. Beyond the road corridor, soils are undisturbed and support healthy, relatively stable coniferous forests.

### *Vegetation*

Vegetation communities in the park range from temperate forests to alpine and subalpine vegetation (figure 10). The Fryingpan Creek project area is approximately 7.5 acres and includes the roadway, the Fryingpan Creek Bridge and associated infrastructure, Fryingpan Creek, and the surrounding forest. The project area ranges in elevation from approximately 3,700 to 3,900 feet; it is located within a forested area just below the lower limits of the subalpine zone in the West Cascades ecoregion. The vegetated areas within the project area primarily consist of subalpine coniferous forest, areas of steep subalpine shrubland, and riparian zones associated with Fryingpan Creek (NPS 2022a).

A plant survey conducted for this project in August 2021 identified 83 unique species; including one species of concern for the park and one nonnative species; no federally or state-listed endangered, threatened, or sensitive plant species were identified. Five distinct landforms were identified — an alluvial riverbed associated with Fryingpan Creek, a terraced riparian floodplain, areas of steep-sloped subalpine shrubland, coniferous forest, and roadside edges associated with Sunrise Road. Terrain within these landforms varies and each landform contains its own plant community with dominant species that create specific and habitats (NPS 2022a). The following paragraphs describe the vegetation communities observed during the 2021 survey.

The riverbed associated with Fryingpan Creek mostly consists of pebbles and cobbles with areas of deposited sand and stranded large woody debris. Clusters of herbaceous vegetation were present throughout the riverbed, including purple monkeyflower (*Erythranthe lewisii*), fireweed (*Chamaenerion angustifolium*), streambank springbeauty (*Montia parvifolia*), Mertens' rush (*Juncus mertensianus*), Cascade aster (*Eucephalus ledophyllus*), western fescue (*Festuca occidentalis*), pearly everlasting (*Anaphalis margaritacea*), bluejoint grass (*Calamagrostis canadensis*), and narrow-leaved phacelia (*Phacelia hastata*). Scrub-shrub vegetation consists of Sitka alder (*Alnus viridis ssp. sinuata*), Sitka willow (*Salix sitchensis*), Engelmann spruce (*Picea engelmannii* var. *engelmannii*), and Douglas-fir (*Pseudotsuga menziesii*).

On the west side of Fryingpan Creek, the vegetative community of terraced floodplain contains Sitka alder, devil's club (*Oplopanax horridus*), oak fern (*Gymnocarpium dryopteris*), tall bluebell (*Mertensia paniculata*), wild ginger (*Asarum caudatum*), and vanilla-leaf (*Achlys triphylla*), as well as a small amount of heartleaf arnica (*Arnica cordifolia*) associated with a wetland perched on the terraced floodplain. Heartleaf arnica is identified as a species of concern for the park but listed as globally secure (NatureServe 2022a).

On the east side of Fryingpan Creek, there is no terraced floodplain. Instead, the landscape transitions into a steep slope with sparse forest and scrub-shrub vegetation including salmonberry (*Rubus spectabilis*), oval-leaf blueberry (*Vaccinium ovalifolium*), western hemlock (*Tsuga heterophylla*), Douglas-fir, huckleberries (*Vaccinium* spp.), and Engelmann spruce. On the steep slopes that extend down from

Sunrise Road to the west side of Fryingpan Creek, a subalpine scrub-shrub community is dominated by black currant (*Ribes lacustre*), oval-leaf blueberry, Sitka alder, dwarf bramble (*Rubus lasiococcus*), with pathfinder (*Adenocaulon bicolor*) and pearly everlasting in the understory. One nonnative species, Canada thistle (*Cirsium arvense*), was also observed north of the bridge in open sunny patches in the steep-sloped subalpine shrubland zone. Canada thistle is listed on the NPS Invasive species list and as a Class C noxious weed according to the Washington State Noxious Weed Board (2021); Class C weeds are either already widespread in Washington or are of special interest to the agricultural industry. This is also a species that continues to be a priority for control and removal within the park.

The coniferous forest, which dominates much of the project area, is a typical silver fir — western hemlock forest. Dominant coniferous trees include silver fir (Abies amabilis), Douglas-fir, western hemlock, and subalpine fir (*Abies lasiocarpa*). The scrub-shrub understory includes devil's club, dwarf bramble, thimbleberry (*Rubus parviflorus*), salmonberry, oval-leaf blueberry, coralroot (*Corallorhiza* sp.), Oregon grape (*Mahonia nervosa*), and bunchberry (*Cornus canadensis*). Dominant herbaceous vegetation includes vanilla-leaf, queen's cup (*Clintonia uniflora*), wild ginger, foamflower (*Tiarella trifoliata* var. *unifoliata*), twisted stalk (*Streptopus amplexifolius*), small bedstraw (*Galium trifidum*), and deer fern (*Blechnum spicant*).

The roadside edges associated with Sunrise Road host a variety of species due to the combination of direct sunlight exposure, foot traffic, and stormwater runoff. Species along the roadsides are varied and include western red cedar (*Thuja plicata*), white rhododendron (*Rhododendron albiflorum*), whitebark raspberry (*Rubus leucodermis*), salmonberry, twinflower (*Linnea borealis*), Oregon boxleaf (*Paxistima myrsinites*), pearly everlasting, sword fern (*Polystichum munitum*), Douglas-fir, Sitka willow, black gooseberry (*Ribes lacustre*), kinnikinnick (*Arctostaphylos uva-ursi*), broadleaf lupine (*Lupinus latifolius*), oval-leaf blueberry, Sitka alder, western hemlock, silver fir, black cottonwood (*Populus trichocarpa*), field horsetail (*Equisetum arvense*), woodland strawberry (*Fragaria vesca*), slender bog orchid (*Plantathera stricta*), fireweed, oak fern, huckleberries, and cow parsnip (*Heracleum maximum*).

Park staff inventoried the trees growing in the project area (using the 30% design footprint) in the summer of 2022. This inventory identified trees of nine different species: Pacific silver fir (*Abies amabilis*), vine maple (*Acer circinatum*), red alder (*Alnus rubra*), Alaska yellow cedar (*Callitropsis nootkatensis*), Engelmann spruce, western white pine (*Pinus monticola*), Douglas-fir, western hemlock, and mountain hemlock (*Tsuga mertensiana*). Since then, the project area has been expanded. Rather than repeating the total inventory, estimates of trees in different size classes in this section are based on calculations of tree density per acre. The current 7.5-acre project area contains approximately 3,000 trees; approximately 91% of the trees in the project area are less than 18 inches DBH, 8% of the trees are between 18 and 40 inches in DBH, and 1% are more than 40 inches in DBH. The 2022 tree inventory identified 14 trees of special conservation interest within the initial project area. These were all living trees greater than 40 inches in DBH; seven of these trees also contained branch structures that may be suitable for use as murrelet nesting platforms. Additional large trees (greater than 40 inches DBH) are expected within the expanded project area.

**Figure 9. Soil Complexes within the Project Area**

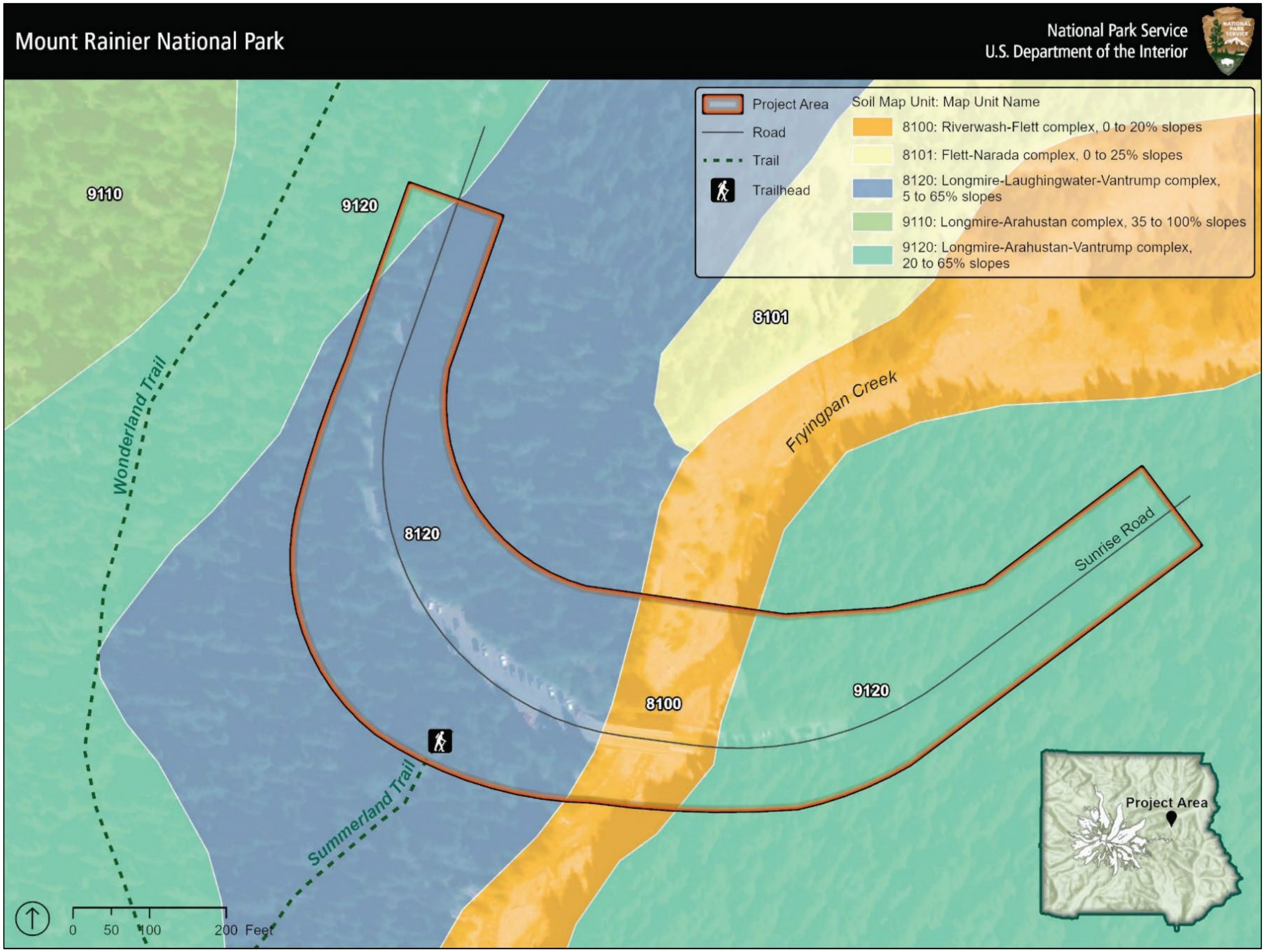
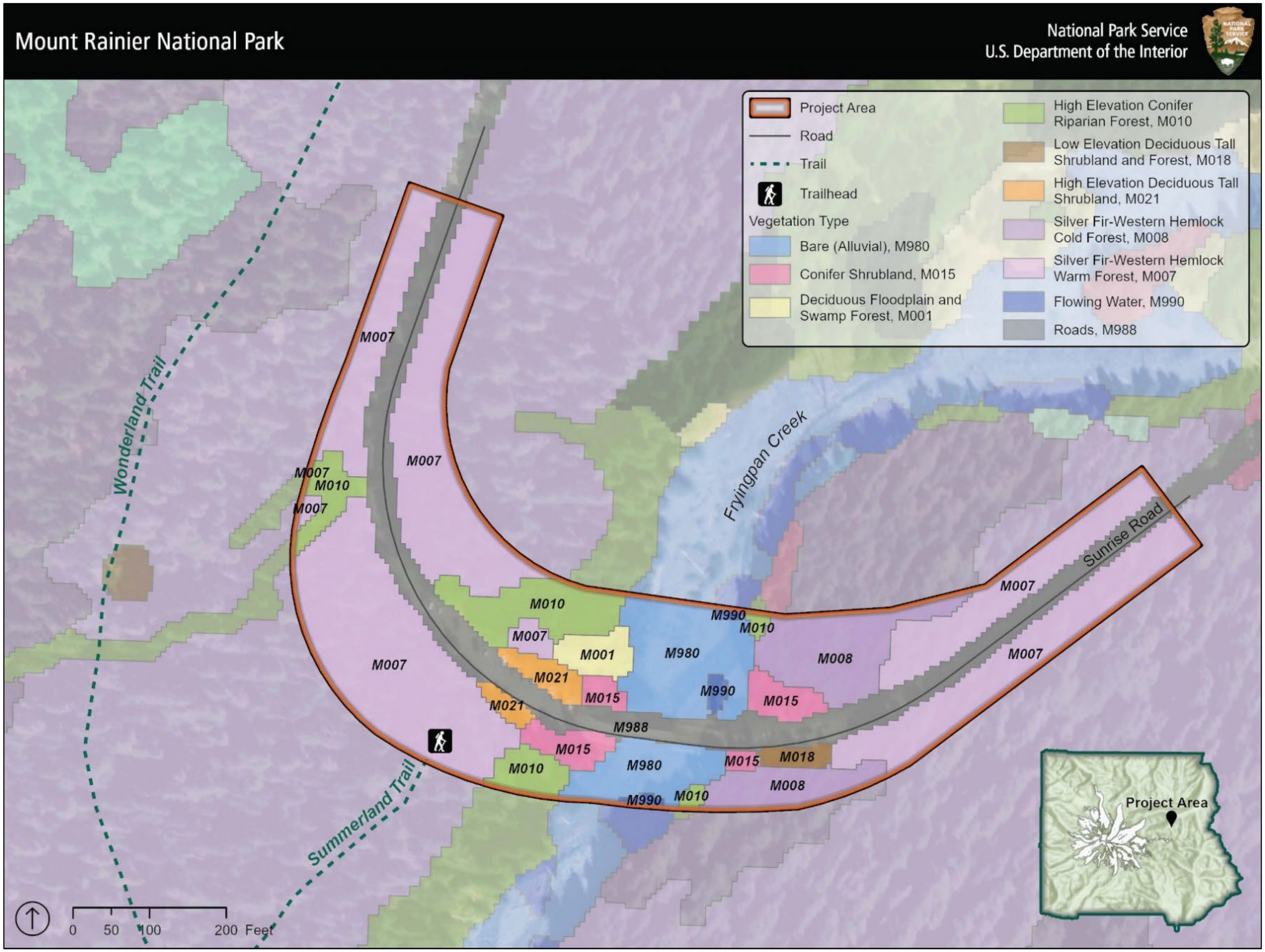


**Figure 10. Vegetation within the Project Area**



**Environmental Trends.** Changes in temperature and water availability due to climate change can alter species composition in an ecosystem. Long-term forest monitoring in Mount Rainier National Park and other Pacific Northwest parks has shown that tree mortality has not yet increased significantly above baseline in old-growth forest plots, but there is evidence of a slight increase in mortality in general correlated with changing snow and rain patterns. The old-growth forests in these parks, which are largely undisturbed and buffered from further development, may be able to withstand these initial strong climatic swings, but that may not be the case as development encroaches further into forest stands (NPS n.d.). This is supported by other studies that found that trees are less vulnerable to climate change in crowded old-growth stands (Ford et al. 2017). However, trees in edge environments, like the new construction cuts, are increasingly vulnerable to a changing climate (Reinmann and Hutyra 2016).

## Impacts Assessment for Soils and Vegetation

In this section, the impacts on soils and vegetation from the three alternatives are analyzed. Changes in plant community size, integrity, or continuity could occur from the implementation of the alternatives due to vegetation and soil removal, soil compaction, disturbance, and the spread of nonnative species.

### *Impacts of Alternative A*

Under alternative A, the existing Fryingpan Creek Bridge and Sunrise Road alignment would remain. The current parking area, which is insufficient for the number of visitors to the Summerland Trailhead, would remain and visitors would continue to park on the unpaved shoulders of Sunrise Road, leading to continuing soil compaction, disturbance, and areas denuded of vegetation. Routine maintenance, including mowing the roadside edges and selective removal of woody vegetation, would also continue. Alternative A would not result in any new impacts on soils or vegetation unless catastrophic failure of the bridge occurs.

### *Impacts of Alternative B (Proposed Action/Preferred Alternative)*

Alternative B would impact soils and vegetation communities, primarily vegetation and soil removal with some permanent loss of these resources from installation of new impervious surfaces. Use of the staging areas would not result in new impacts on soils and vegetation because these areas are either paved or graveled.

During the preconstruction phase and site preparation for the construction phase, approximately 2.3 acres of the project area would be cleared and grubbed for construction, meaning that all surface material (e.g., trees, shrubs, herbaceous plants) and all vegetative material below the surface (e.g., roots, stumps, buried logs) in this area would be removed. Of the total area to be cleared, approximately 1.5 acres are associated with the new bridge and road alignment (including culverts), and the remaining 0.8 acre would be removed for construction of the parking area. The habitat disturbed would be mature coniferous forest (1.7 acre), steep alpine shrubland (0.2 acre), and roadside edge (0.4 acre) (table 3). Within this area, no more than 925 trees would be removed, including approximately 80 with a DBH of 18 inches or greater. Six trees of conservation interest (as described on page 40) would be removed. Three of these trees (two silver firs and one western hemlock) are within the proposed permanent parking area and at least two (silver fir and Douglas-fir) are within the proposed road alignment with another specimen (silver fir) at the very edge of the clearing limits. Additional large trees (greater than 40 inches DBH) are expected within the expanded clearing limits south of the parking area. Based on a tree survey conducted during the summer of 2022, which estimated approximately 3,000 trees in the project area, alternative B would require the removal of up to 31% of the trees in the project area. As noted previously, the final design may be modified to minimize impacts, and existing vegetation — especially large trees — would be retained to the extent possible.

**Table 3. Vegetation Clearing under Alternatives B and C**

| Vegetation Community | Alternative B | | | Alternative C | | |
|---|---|---|---|---|---|---|
| | Direct Impacts (acres) | Permanent Impacts (acres) | Revegetated Following Construction (acres) | Direct Impacts (acres) | Permanent Impacts (acres) | Revegetated Following Construction (acres) |
| Mature Coniferous Forest | 1.7 | 0.4 | 1.3* | 1.2 | 0 | 1.2* |
| Steep Alpine Shrubland | 0.2 | 0.1 | 0.1 | 0.2 | 0 | 0.2 |
| Roadside Edge | 0.4 | 0.1 | 0.3 | 0.4 | 0 | 0.4 |

* Although these areas would be revegetated following construction, restoration to mature forest would take decades.

Temporary isolation work zones would be required to install piles to support work platforms for bridge construction, as well as for bridge abutment construction and demolition. These dewatered work areas would be in place for the duration needed to install the steel piles (for the work platforms) or for the construction season (for the installation or removal of the bridge abutments). To create these work zones, tracked equipment, such as an excavator, would need to cross the riverbed and could compact clusters of herbaceous vegetation that grow among the cobble throughout the riverbed. These impacts would occur in the area of the existing bridge and in the new alignment, which is located slightly downstream of the existing bridge. Plants in the dewatered zones would be lost due to the lack of water during construction, the movement of construction equipment, and the placement of piles and bridge abutments.

The realigned road and parking area would require 0.6 acre of new impervious surface (0.3 acre for the road and 0.3 acre for the parking area). In these areas, soils would be excavated, removed, and replaced with fill. Construction of the road and parking area would result in the permanent removal of approximately 0.4 acre of mature coniferous forest, 0.1 acre of steep alpine shrubland, and 0.1 acre of roadside edge habitat (table 3). Once construction is complete, the existing Fryingpan Creek Bridge and roadway would be removed. Removal of the road would result in an additional 0.2 acre of disturbed area that would be part of the restoration and revegetation efforts described below.

Vegetation removal and soil disturbance could facilitate the spread of nonnative invasive plant species, ultimately degrading native vegetation communities. Further, compacted soils often become devoid of vegetation because the soil's ability to hold and conduct water, nutrients, and air necessary for plant root growth is adversely affected (UM 2018). Soil compaction could also increase surface erosion, which removes topsoil, reduces levels of soil organic matter, and contributes to the breakdown of soil structure (USDA 1996). Mitigation measures and BMPs (see Appendix B: Resource Protection Measures) would be implemented to minimize impacts from soil compaction, erosion, and the introduction of invasive species.

Park staff would collect seeds from native plants and topsoil would be salvaged from the areas to be cleared for construction activities. Following construction, the soils in all disturbed areas would be de-compacted. Native seeds and plants sourced from the park or genetically appropriate seed zones would be used to restore areas that were disturbed during construction, helping to stabilize soils and reduce impacts from construction activities. Following revegetation, the restored areas would be monitored for five years, treated for nonnative invasive species, and replanted, as necessary. Restoration of the existing natural conditions would be a long-term goal, and it would take decades to establish mature vegetation. Even after decades, proposed revegetation would also not replicate the habitat lost, including the mature coniferous forest in the project area. The revegetation efforts could be less successful or shift to different vegetation communities under a changing climate. As discussed in the "Affected Environment" section above, vegetation in edge environments, such as those along roadways, is more susceptible to impacts from climate change.

Overall, under alternative B, approximately 2.3 acres of vegetation would be cleared and grubbed for construction, and 0.6 acre of impervious surface would be added. Following construction, 0.2 acre of impervious surface (existing roadway) would be removed and a total of 1.9 acres would be revegetated. The area would take decades to even approach a young version of the mature forest that exists in the project area currently. For these reasons, the entire 1.7 acres of mature coniferous forest cleared for alternative B would be considered a permanent loss. The vegetation communities along the roadway would remain vulnerable to impacts from climate change.

### *Impacts of Alternative C*

Alternative C would require construction of a temporary bridge to retain access to the Sunrise area and allow for the construction of a new, longer bridge on the alignment of the existing bridge and road. The clearing area would be similar to alternative B; however, alternative C would require additional disturbance around the existing bridge abutments and would not require clearing for the parking area (see figure 7). Approximately 1.8 acres would be cleared and grubbed (table 3) — 1.2 acres of mature coniferous forest, 0.2 acre of steep alpine shrubland, and 0.4 acre of roadside edge — in the same manner as described for alternative B. Within the clearing limits for alternative C, up to 690 trees would be removed, including about 60 with a DBH of 18 inches or more. At least two trees of conservation concern would be removed for construction of the temporary bridge and roadway, one silver fir and one Douglas-fir that are within the proposed road alignment. Another silver fir is at the very edge of the clearing limits and may also have to be removed. Based on the 2021 tree survey, alternative C would require removal of up to 23% of the trees in the project area.

Temporary work isolation zones would be required for construction; however, there would be more in-water work than alternative B due to the need for the temporary bridge. Essentially, alternative C would require construction and demolition of two bridges. The impacts would be similar to alternative B in that plants in the dewatered zones would be lost and herbaceous vegetation that grows among the cobble could be crushed along the existing and downstream alignments, but alternative C may disturb an additional portion of the streambed along the existing alignment (less than 0.1 acre).

Following construction of the new bridge on the existing alignment, the temporary bridge and roadway would be removed and the disturbed area (1.8 acres) would be revegetated. However, alternative C would not result in a permanent loss of native soils because stockpiled soils would be replaced after construction. The process for revegetation, as well as the limitations, would be the same as described for alternative B. Although there would not be any permanent loss of vegetation from new impervious surface, the disturbed areas would not even approach a young version of the current mature forested habitat for decades. For these reasons, the entire 1.2 acres of mature coniferous forest cleared for alternative C would be considered a permanent loss. Further, there is the potential that the vegetation communities could shift due to a changing climate.

### *Cumulative Impacts on Soils and Vegetation*

As discussed in the "Affected Environment" section above, vegetation communities, especially those in edge environments, could be affected by a changing climate regardless of the alternative. In addition, past, present, and future planned actions in the park have had or could have adverse impacts on the native soils and vegetation communities in the park. For example, future road projects (e.g., the SR-123 Project and the Fairfax Forest Reserve Road East Project) and facility upgrades (e.g., rehabilitation of the day-use area at the Paradise Area and rehabilitation of the Ohanapecosh Campground) would involve ground disturbance, removal of soils, clearing of vegetation, and the potential spread of nonnative species. Even though most park projects do not remove intact habitat but rather recur in previously disturbed/developed areas and the park would continue to implement mitigation measures to reduce these adverse impacts on vegetation and soils, these projects would contribute long-term adverse effects on the vegetation and soils at the park. Impacts on vegetation and soils have also occurred from recent flooding, which has caused loss of intact habitat areas. The park must rebuild lost infrastructure, and though the new infrastructure would be constructed to be more resilient to future flooding, it would result in additional impacts.

Alternative A would not contribute to the cumulative adverse effects on vegetation because the area has been developed for decades and would not be further disturbed. Alternatives B and C would contribute additional cumulative adverse effects, specifically from the loss of mature coniferous forest. The park conserves a significant portion of unlogged/not recently logged forests in the Pacific Northwest, which have been flagged globally as a location of irrecoverable carbon or carbon stores that are critical to managing climate change (Noon et al. 2022). Removal of up to 1.7 and 1.2 acres of mature forest under alternatives B and C, respectively, would represent a permanent loss. Although this loss is meaningful, the impacts from alternatives B and C are small within the vicinity of the project area, park, and region and would not constitute a substantial contribution to the cumulative impacts on vegetation.

### *Conclusion for Soils and Vegetation*

Under alternative A, the treatment of vegetation would remain the same as current management, and vegetation communities within the project area would not be affected by the management of the Fryingpan Creek Bridge. Alternative A would not contribute to cumulative impacts on vegetation and soils, since the area has been developed in its current developed state for decades. Alternatives B and C would require the removal of vegetation to complete construction activities. Approximately 2.3 acres of vegetation would be cleared for alternative B, and approximately 0.6 acre of new impervious surface would be required for the new road alignment and the expanded parking area, resulting in permanent vegetation removal. Removal of asphalt from the existing road would allow for revegetation of approximately 0.2 acre and reduce the net increase to 0.4 acre of impervious surface. Alternative C would affect a smaller area of soils and vegetation than alternative B with approximately 1.8 acres of clearing needed for the temporary bridge and road alignment and construction of the new bridge. Although alternative B represents a greater area of disturbance, including the permanent loss of a small portion of soils and vegetation, alternative C would disturb an area of mature undisturbed forest for the construction of temporary infrastructure. Both alternatives B and C would restore disturbed areas associated with construction (the existing road under alternative B and the area of the temporary bridge and road under alternative C) by revegetating with native soils and plants; however, restored areas would take decades to reach maturity, require repeated vegetation treatments, and be susceptible to nonnative species growth and a potential shift in vegetation communities. Therefore, the areas of mature coniferous forest cleared for construction (1.7 acres for alternative B and 1.2 acres for alternative C) would be considered a permanent loss. The area of vegetation that would be impacted is small relative to the amount of existing coniferous forest, steep alpine shrubland, and roadside edge habitats that are available within the park.

However, the removal of mature forest from the park is important because, unlike many park projects, this one removes a small area of mature forest habitat instead of a few trees. Given the small area affected, alternatives B and C would not have population-level impacts on vegetation communities. The majority of the project area was previously disturbed in the 1930s by the construction of Sunrise Road and the Fryingpan Creek Bridge. Both alternatives B and C would have impacts on a small portion of the coniferous forest, steep alpine shrubland, and roadside edge habitats that are widespread throughout the park. Alternatives B and C would not make a substantial contribution to the impacts on vegetation and soil from other ongoing and future projects.

# Wetlands

## Affected Environment

For this environmental assessment and compliance with Executive Order 11990, "Protection of Wetlands," the NPS uses *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979) as the standard for defining, classifying, and inventorying wetlands. Habitats addressed for this analysis include wetlands, navigable waters, lakes, ponds, small streams, and some ditches. A stream and wetland delineation was conducted in July 2021 (FHWA 2022a) to locate all wetlands in the project area. In addition to Fryingpan Creek, three unnamed intermittent streams, two wetlands, and four potentially jurisdictional ditches were identified (figure 11). The naming convention for the wetlands, streams, and ditches was changed from that in the wetland delineation report (FHWA 2022a) for clarity in this EA. The wetland delineation effort only mapped features classified as wetlands or those that were potentially jurisdictional. When analyzing impacts on wetlands and riparian areas, Washington state typically requires the analysis to also include potential impacts on wetland buffers, which are established by the counties based on the best available science for protecting sensitive habitats (in this case Pierce County). Buffers are essential for the protection of wetlands and riparian areas; they can reduce impacts from adjacent development, provide important habitat for wetland-associated species, and reduce the effects of stormwater runoff (Castelle et al. 1992). The buffers for each of the wetlands within the project area are identified in the following paragraphs.

The project area includes a 250-foot-long section of Fryingpan Creek, a perennial stream. The stream is approximately 114 feet wide at the bridge abutments and 165 feet wide at the downstream end of the project area at the OHWM. The riparian buffer width for Fryingpan Creek, a natural fish-bearing stream, is 150 feet from the OHWM.

The two wetlands are located west of the Fryingpan Creek Bridge (figure 11). A small scrub-shrub wetland (wetland B, approximately 0.02 acre) occurs on a gradual slope immediately to the east of Sunrise Road. It should be noted that the wetland delineation was performed in the summer of 2021, and the project area boundary has been expanded since that time. Wetland B as presented in figure 11 shows the delineated boundary; however, this wetland extends further east both within and beyond the project area (meaning that figure 11 does not show the entire wetland, just the delineated portion). The wetland is fed from groundwater seepage and shallow subsurface flow. Dominant woody species include devil's club, salmonberry, swamp gooseberry (*Ribes lacustre*), and silver fir saplings. The herbaceous layer includes clasping twistedstalk (*Streptopus amplexifolius*), stream violet (*Viola glabella*), starry Solomon's seal (*Maianthemum stellatum*), foamflower, and lady fern (*Athyrium filix-femina* var. *cyclosorum*). There were abundant downed logs in the wetland at the time of the delineation. The buffer for wetland B is 150 feet; the buffer is truncated by Sunrise Road with the remaining buffer comprised of undisturbed silver fir and western hemlock coniferous forest.

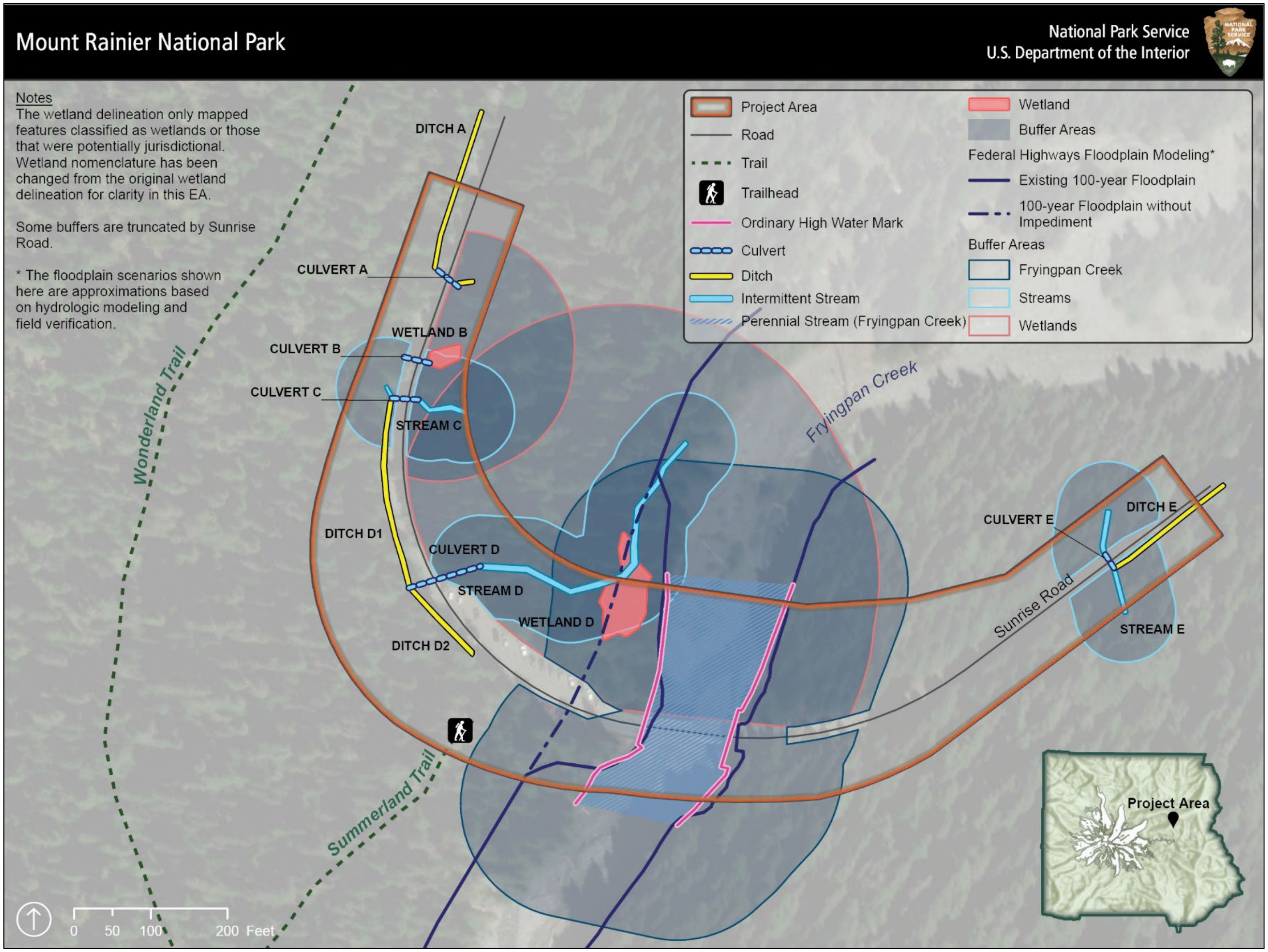
A forested wetland (wetland D) of approximately 0.1 acre occurs above the west bank of Fryingpan Creek, approximately 2 to 4 feet in elevation above the stream channel. A portion of wetland D is occasionally to seasonally flooded by stream D and Fryingpan Creek, and a portion is seasonally saturated. This wetland is dominated by Engelmann spruce and Pacific silver fir in the canopy, and the understory includes Sitka alder, salmonberry, devil's club, stink current (*Ribes bracteosum*), vanilla-leaf, and oak fern in the understory. Slender bog-orchid (*Platanthera stricta*), foamflower, false hellebore (*Veratrum viride* var. *eschscholzianum*), and mannagrass (*Glyceria* sp.) are present in wetter areas. The buffer for this forested wetland is 300 feet and is truncated on the south side due to the presence of Sunrise Road, but the remaining buffer includes undisturbed coniferous forest dominated by silver fir and western hemlock (figure 11). Wetland D is also bordered by Fryingpan Creek.

The project area contains three small, unnamed, intermittent streams (streams C, D, and E) that are tributaries to Fryingpan Creek; streams C and D are west of the Fryingpan Creek Bridge, and stream E is east of the bridge (see figure 11). Stream C is located just south of wetland B. Stream C forms from flow that is coming from a roadside ditch and crosses the road through culvert C. Similarly, stream D is fed by a ditch on the south side of the road that collects snowmelt and slope seepage before crossing the road in culvert D; stream D feeds wetland D just north of the Fryingpan Creek Bridge. Stream E is a steep-gradient stream that forms above the road, crosses the road in culvert E, and becomes less steep downslope of the road. These non-fish-bearing stream channels vary from 2 to 6 feet with streambeds of gravel, cobble, and woody debris (FHWA 2022a). The riparian buffers for the three streams are 65 feet from the OHWM and are generally composed of upland coniferous forest habitat.

A ditch is generally defined as a human-made structure to convey water. A ditch can be considered an NPS wetland and a jurisdictional wetland if it meets certain criteria. The four ditches within the project area support wetland vegetation and provide hydrological functions; therefore, these ditches are included as wetlands in this analysis. The three small ditches (ditches A, D1, D2, and E) are located on the uphill side of the road and support wetland vegetation (figure 11). These ditches are small (approximately 2 feet wide), have silt to gravel bottoms, and intercept groundwater seepage and snow melt from the forested slopes above the road. Vegetation observed in the ditches during the 2021 delineation includes Sitka alder, black cottonwood (*Populus trichocarpa*) saplings, salmonberry, thimbleberry, tall northern aster (*Canadanthus modestus*), arrow-leaf coltsfoot (*Petasites frigidus* var. *palmatus*), and yellow monkeyflower (*Erythranthe guttata*). Ditch A is a small ditch that flows through culvert A under the road and discharges below the road. Ditches D1 and D2 are small ditches that flow alongside the road, enter culvert D and discharge into stream D, which flows downstream to wetland D. Ditch E is a small ditch that flows alongside the road at the eastern end of the project area and discharges into stream E just above where the stream enters culvert E. Pierce County does not require an analysis of a buffer for ditches.

The five culverts within the project area (culverts A through E) that convey water across Sunrise Road, as noted above, are currently undersized. During wet periods (particularly in the spring), the culverts do not provide adequate capacity for the conditions at the site, resulting in excess stormwater runoff and occasional flooding on the road. Undersized culverts restrict natural stream flows, particularly during floods. Water exits the culvert at a high velocity, which leads to excess scour and erosion. Improperly sized culverts create flow and channel conditions that are different from natural conditions, impeding movement of aquatic organisms.

**Figure 11. Wetlands and the Floodplain in the Project Area**



### *Environmental Trends*

Wetlands are considered highly sensitive to climate change, and the Cascades region is particularly sensitive to climate change. Shifts in the timing of snowfall and snowmelt, soil moisture stress, and recharge are already occurring and could result in systemic changes in the timing and duration of water available to wetland wildlife and plants. One study used modeling to determine the effects of climate change on montane wetlands in the western United States (Lee et al. 2015). Data for this study were collected from Mount Rainier National Park, Olympic National Park, Willamette National Forest (Oregon), Deschutes National Forest (Oregon), and Trinity Alps Wilderness (California). Results of this study indicate that the effects of climate change on montane wetlands are likely to result in earlier and faster drawdown (lower water levels resulting from extended dry periods) in Pacific Northwest montane wetlands, leading to systemic reductions in water levels, shortened wetland hydroperiods (the length of time and portion of the year the wetland holds ponded water), and increased probability of drying (Lee et al. 2015).

## Impacts Assessment for Wetlands

In this section, the impacts on wetlands and wetland buffers from the three alternatives are analyzed. Construction activities associated with the Fryingpan Creek Bridge project could cause direct and indirect impacts on wetlands through temporary impacts on wetlands and their buffers, as well as permanent loss of wetlands and wetland buffers. Indirect impacts on wetlands could result from potential impacts on water quality, primarily from construction activities. Water quality could be impacted if erosion occurs, resulting in increased turbidity, or if accidental spills occur. These impacts are also evaluated in this section.

### *Impacts of Alternative A*

Because Fryingpan Creek Bridge would be retained, there would be no new impacts on wetlands. However, there would be continuing impacts on wetlands and wetland buffers from vegetation maintenance and bridge maintenance.

Vegetation maintenance would require park staff to occasionally trim vegetation within wetland and stream buffers. In most cases, vegetation would not be removed, and this maintenance would not have an impact on the buffers, as the vegetation would persist and continue to grow. Bridge maintenance includes the periodic replacement of riprap at the bridge abutments to prevent undermining. This action would introduce fill material (riprap) into Fryingpan Creek and has the potential to affect creek evolution processes, riparian succession, sedimentation processes, habitat, and biological community interactions (Fischenich 2003). Because the abutments are already armored with riprap and the addition of new riprap would be minimal because there would be few effects from this action.

Under alternative A, the culverts would not be replaced and temporary flow disruptions that occur when the culverts are inundated or become clogged would continue, causing minor impacts on water quality and habitat in streams and wetlands downstream of the culvert, as discussed in the "Affected Environment" section.

If the Fryingpan Creek Bridge were to deteriorate more or fail, the collapsed bridge would result in long-term adverse impacts on Fryingpan Creek, as the bridge would represent fill in the perennial stream. This would disrupt the natural functions and values of the stream, including its ability to provide habitat for fish and amphibian species. The impact on Fryingpan Creek from the collapse of the bridge would be substantial.

### *Impacts of Alternative B (Proposed Action/Preferred Alternative)*

Construction and demolition activities under alternative B would have both direct and indirect impacts on wetlands and wetland buffers within the project area. Table 4 presents the area of impact for each wetland that would be directly impacted by the construction of the new bridge on the new alignment. The impacts on the wetland buffers are described in the analysis. Because the project area is small, the individual wetland buffers overlap (see figure 11), as would impacts. The total impact on wetland buffer zones would be approximately 2.1 acres; however, when factoring in overlapping buffer areas, the net impact to the wetland buffers is 1.3 acres, the difference between the total and net impacts on wetland buffers underscores the extent of overlap among the distinct wetlands and streams. Although road designs would avoid wetlands to the extent possible, where avoidance is not feasible, resource protection measures would be used to reduce impacts. These measures include ground protection mats or similar devices to minimize impacts on wetland vegetation and sediment and erosion controls to limit the amount of nonpoint source pollution.

The five culverts within the project area would be replaced and upsized during construction, which would result in some small impacts on wetlands from excavation at each end of the culverts. Impacts associated with the excavation and replacement of the culverts could include the removal of vegetation and soil at each end of the culvert and removal of soil beneath the existing culvert; however, the extent of these impacts would be minimal. Because the sizes of the replacement culverts have not yet been determined, this analysis assumes that all areas of wetlands, streams, and ditches near the culverts within the clearing limits would be permanent impacts. This is likely an overestimation, but even with this conservative estimate, the total permanent impact on wetlands, streams, and ditches (table 2) for all activities, road construction, and culvert replacement total approximately 900 square feet, or 0.02 acres. Impacts from culvert replacement represent a small fraction of this total.

The culverts to be replaced are in streams and ditches that are intermittent. Culvert D, west of Fryingpan Creek (see figure 11), would be replaced during the project’s established in-water work window. If possible, construction work on the remaining culverts would occur when the waterbodies are not watered to avoid impacts on water quality and to avoid disrupting stream flow below the culverts. Additionally, the existing culverts are undersized, causing occasional ponding above the culverts during storm events and reducing flow to downstream wetlands. Replacing the existing culverts with larger culverts sized to properly transport typical storm flow and reducing the likelihood of clogging by debris would restore hydrology to more natural conditions, reducing current impacts on wetland B, streams C, D, and E, and ditches A, D1, D2, and E.

**Table 4. Wetland Impacts – Temporary and Permanent Impacts**

| Feature | Alternative B | | | Alternative C | | |
|---|---|---|---|---|---|---|
| | Direct Impacts | Permanent Impacts | Revegetated Following Construction | Direct Impacts | Permanent Impacts | Revegetated Following Construction |
| Fryingpan Creek | N/A | N/A | N/A | 0.004 acre (175 sq. ft.) | N/A | 0.004 acre (175 sq. ft.) |
| Wetland B (scrub-shrub wetland) | 0.008 acre (350 sq. ft.) | 0.008 acre (350 sq. ft.) | N/A | 0.008 acre (350 sq. ft.) | 0.008 acre (350 sq. ft.) | N/A |
| Wetland D (forested wetland) | N/A | N/A | N/A | N/A | N/A | N/A |
| Stream C | 0.003 acre (130 sq. ft.) | 0.003 acre (130 sq. ft.) | N/A | 0.003 acre (130 sq. ft.) | 0.003 acre (130 sq. ft.) | N/A |
| Stream D | 0.0006 acre (30 sq. ft.) | 0.0006 acre (30 sq. ft.) | N/A | 0.0006 acre (30 sq. ft.) | 0.0006 acre (30 sq. ft.) | N/A |
| Stream E | 0.003 acre (120 sq. ft.) | 0.003 acre (120 sq. ft.) | N/A | 0.003 acre (120 sq. ft.) | 0.003 acre (120 sq. ft.) | N/A |
| Ditch A | 0.002 acre (75 sq. ft.) | 0.002 acre (75 sq. ft.) | N/A | 0.002 acre (75 sq. ft.) | 0.002 acre (75 sq. ft.) | N/A |
| Ditch D1 | 0.01 acres (490 sq. ft.) | 0.0009 acres (40 sq. ft.) | 0.01 acres (450 sq. ft.) | 0.01 acres (450 sq. ft.) | 0.0009 acres (40 sq. ft.) | 0.009 acres (410 sq. ft.) |
| Ditch D2 | 0.006 acre (240 sq. ft.) | 0.006 acre (240 sq. ft.) | N/A | 0.004 acre (160 sq. ft.) | 0.0009 acres (40 sq. ft.) | 0.003 acre (120 sq. ft.) |
| Ditch E | 0.001 acre (65 sq. ft.) | N/A | 0.001 acre (65 sq. ft.) | 0.001 acre (65 sq. ft.) | N/A | 0.001 acre (65 sq. ft.) |

Notes: The total acreage affected may be slightly skewed due to rounding. This table only includes impacts on wetlands, streams, and ditches. Impacts on wetland buffers are discussed in the text.
sq. ft. = square feet
N/A = not applicable – This feature would not be affected by vegetation clearing and grubbing or placement of new impervious surface.

**Fryingpan Creek.** Use of heavy construction equipment and work zones would have an impact on Fryingpan Creek. These impacts would be short-term and localized, lasting for the duration of construction (two to three years). The work zones would be dewatered, resulting in areas of altered hydrology. The tracked equipment needed to develop the work zones would create sedimentation in the creek but creating the work zones would reduce the potential for widespread turbidity impacts. If blasting is required to construct the new abutments, this may also result in sedimentation. Measures would be taken to minimize sedimentation impacts, such as discharging water from the work zones to an upland location for infiltration to prevent turbid water from entering the creek and turbidity monitoring (see appendix B). If turbidity exceeded permitting requirements, the in-water activities would be halted until standards were met, and the construction methods would be changed to avoid future exceedances. Further, restrictions on fueling and prevention of fluid leaks from construction equipment would minimize discharge of pollutants into the creek. The use of tracked equipment, in-water work, and dewatered work zones would also have impacts on flora and fauna. Fish would be removed from the work zones prior to dewatering, but activities would have a direct impact on other aquatic organisms, up to and including mortality, as well as indirect impacts from sedimentation, which can alter water quality parameters making the habitat less suitable for the duration of construction. As noted in the "Soils and Vegetation" section, plants within the streambed would be trampled by the tracked equipment and plants in the dewatered zones would be lost due to the lack of water during construction, the movement of construction equipment, and the placement of piles and bridge abutments. The tracked equipment would also affect the stream bottom by compacting sediments and moving small rocks. These changes would alter habitat for fish and other aquatic organisms. All these impacts would also occur during demolition of the existing bridge and abutments because of the need for tracked equipment and dewatered work zones for demolition activities.

Alternative B would also have direct impacts on the Fryingpan Creek wetland buffer zone, which is comprised of mature coniferous forest, steep alpine shrubland, and roadside edge habitat. Approximately 0.6 acre would be impacted by clearing and grubbing. Of this area, 0.3 acre would be permanently lost from the construction of the new road and parking area. The remaining 0.3 acre would be revegetated following construction. A portion of the existing road lies within the area of the Fryingpan Creek buffer, and once removed, approximately 0.08 acre of the existing impervious surface would be revegetated. As noted in the "Soils and Vegetation" section, restoration to mature forest habitat would take decades, and due to climate change, disturbed areas may never recover to current conditions. These impacts overlap with the wetland D buffer impacts.

Although a small portion of the creek's buffer would be lost and construction and demolition activities would have short-term impacts on the creek itself, alternative B would reduce the constriction of the creek by moving the abutments completely out of the floodplain. This would allow the natural migration of the creek and natural changes to the creek channel, which creates a variety of habitats for aquatic plants, fish, amphibians, and other aquatic organisms. Fryingpan Creek would continue to be able to support a variety of fish, wildlife, and vegetation.

**Wetland B (Scrub-shrub Wetland).** Construction of the realigned road would not directly impact this small scrub-shrub wetland located east of Sunrise Road. However, at the current level of design, a small area of this wetland (0.008 acre or 350 square feet) would be affected by culvert replacement, as described on page 51. This is likely an overestimation and would be refined as the design progresses. Impacts on all wetlands would be avoided to the extent possible. To minimize impacts from heavy equipment compacting soils and damaging vegetation, silt fencing would be installed around the wetland prior to construction. Removal of vegetation and soils would be required for construction; however, the area not directly affected by the culvert replacement would be revegetated following construction.

Construction would temporarily affect approximately 0.2 acre of the wetland buffer, which is undisturbed coniferous forest, through removal of vegetation and soils to accommodate construction and compaction of soils. Placement of the realigned road would result in permanent loss of 0.02 acre of the wetland buffer. The remainder of the disturbed buffer would be revegetated following construction.

Wetland B provides water quality, hydrologic, and habitat functions, these functions are all rated low to moderate due to the wetland's small size and low diversity of dense vegetation (FHWA 2022a). Vegetation removal could expose the wetland to more sunlight, which could shift the wetland vegetation community at least in the short term. Furthermore, restoration actions would require time for the wetland to be revegetated to the same quality as before construction. Because wetland functions for this area are rated low to moderate, the impacts would be of less importance than if this was a high-functioning wetland. Alternative B would not have an adverse effect on the functions and values of this wetland.

**Wetland D (Forested Wetland).** The new road alignment would not directly impact wetland D, which is located north of the Fryingpan Creek Bridge. However, construction activities, specifically vegetation and soil removal, would impact the wetland buffer, which is comprised of mature coniferous forest, steep alpine shrubland, and roadside edge habitat. Construction activities would temporarily impact 0.8 acre of the wetland buffer from clearing and grubbing and compaction of soils from vehicles and equipment moving over the area. Of this area, 0.2 acre (9,300 square feet) would be permanently lost from the construction of the realigned road; the remaining 0.6 acre would be revegetated following construction. Portion of the wetland D buffer impacts overlap with the impacts on the wetland B buffer and the Fryingpan Creek buffer. This wetland is rated moderate for water quality functions, low for hydrologic functions, and high for habitat functions. The impacts on the wetland buffer from alternative B would not change the functions of this wetland.

**Intermittent Stream C.** Approximately 0.003 acre (130 square feet) of this stream would be directly and permanently impacted by the culvert replacement, as described on page 51. The stream C buffer is comprised of mature coniferous forest and roadside edge habitat. A portion of this buffer would be temporarily affected (0.2 acre) by vegetation clearing and grubbing for construction and approximately 0.01 acre would be permanently lost from placement of the new road. Approximately 0.1 acre of the temporary impact and all the permanent impact overlap with the wetland B buffer impacts; therefore, this would not be an additional impact.

**Intermittent Stream D.** This stream begins downstream of culvert D and a small section, 0.0006 acre (30 square feet) would be directly and permanently impacted by the replacement of the culvert. Impacts associated with culvert replacement would be as described on page 51, including the beneficial impact of restoring more natural hydrology through the culvert, which would benefit this stream and also wetland D. A small portion of this stream's buffer, which is comprised of mature coniferous forest, steep alpine shrubland, and roadside edge habitat, would be temporarily impacted (0.2 acre) by vegetation clearing and grubbing and permanently lost (0.02 acre) by construction of the new road; however, all of this area overlaps with the wetland D buffer and would not be an additional impact.

**Intermittent Stream E.** Approximately 0.003 acre (120 square feet) of this stream would be directly and permanently impacted by culvert replacement. The impacts of culvert replacement would be as described on page 51, including the beneficial impact of restoring more natural hydrology through the culvert, which would benefit this stream. A 0.1- acre portion of this stream's buffer (mature coniferous forest and roadside edge habitat) would be temporarily affected by vegetation clearing and grubbing; this area would be revegetated following construction.

**Ditch A.** Replacing culvert A would result in direct and permanent impacts totaling 0.002 acre (75 square feet). Impacts associated with culvert replacement would be as described on page 51.

**Ditch D1.** Replacing culvert D would result in direct and permanent impacts totaling 0.0009 acre (40 square feet) to ditch D1. Removing vegetation and soils necessary for clearing would result in additional temporary impacts totaling 0.01 acre (450 square feet). Impacts associated with this culvert replacement would only impact ditch D1 at the upstream end of the culvert (downstream end impacts are described for stream D) and would be as described on page 51.

**Ditch D2.** Construction of the new parking area would require relocation of this ditch and would cause direct and permanent impacts on the existing ditch totaling 0.006 acre (240 square feet). The existing ditch would be removed for construction of the new parking area, disturbing vegetation and soils. If ditch D2 is watered during construction, the flow would be rerouted to reach stream D and wetland D, causing temporary minor impacts. During construction, a new ditch would be dug in the vicinity of the existing ditch D2. While impacts on the existing ditch D2 would be permanent, the function of ditch D2 would be maintained by the new ditch. Maintaining and improving the functions of ditch D2, especially flow, with the new ditch would minimize or avoid downstream impacts on stream D and wetland D.

**Ditch E.** Removing vegetation and soils for clearing would result in temporary impacts totaling 0.001 acre (65 square feet) to ditch E. Impacts associated with culvert E replacement would only impact stream E, it would not impact ditch E.

Overall, alternative B would result in some long- and short-term impacts on wetlands. Permanent loss of wetlands (0.02 acre) and wetland buffers (0.6 acre) under alternative B would result from construction of the new road and replacing culverts. The areas temporarily impacted by construction activities would be revegetated and monitored following construction, as described in the "Soils and Vegetation" section. An additional 0.2 acre of impervious surface (existing road) would be removed and restored. Although it would take time for wetland functions and values to be restored to current conditions, the area of impact is relatively small compared to the total area of wetlands (1.2 acres) and wetland buffers (10.2 acres) in the project area, so the overall impact on functions and values of the wetlands should also be minimal.

### *Impacts of Alternative C*

The types of impacts on wetlands from construction and demolition activities under alternative C would be the same as described for alternative B. The area of impacts on wetlands and wetland buffers would be similar to alternative B, as the clearing limits are largely the same. Differences occur around the abutments of the existing bridge, the lack of clearing for an expanded parking area, and the lack of new impervious surface for a realigned road (see figures 7 and 8 in chapter 2).

The permanent impacts on wetlands under alternative C would be those small impacts on streams and ditches from the excavation needed to install larger culverts. The total permanent impact on wetlands, streams, and ditches (table 2) for all activities total approximately 785 square feet or 0.02 acres. This is likely an overestimation, but because the sizes of the replacement culverts have not yet been determined, this analysis assumes that all areas of wetlands, streams, and ditches near the culverts within the clearing limits would be permanent impacts.

Despite the differences in the clearing limits, the area of wetland buffer that would be affected is the same as that for alternative B. The total impact on wetland buffer zones would be approximately 2.1 acres; however, when factoring in overlapping buffer areas, the net impact to the wetland buffers is 1.3 acres. See figure 11 to note the large amount of overlap among the wetland buffers. The land within these 1.3

acres would be cleared and grubbed to accommodate construction, which includes the temporary bridge on the new alignment, removal of the existing bridge, construction of the new bridge, and removal of the temporary bridge. However, under alternative C, all disturbed areas of wetland buffers would be revegetated following construction and demolition activities.

Because the clearing areas and impacts between alternatives B and C are so similar, this discussion will only refer to impacts that differ from alternative B.

**Fryingpan Creek.** Alternative C may require more area within Fryingpan Creek for construction of a new bridge and demolition of the existing bridge on the existing alignment. Approximately 0.004 acre (175 square feet) would be directly affected through disturbance to the creek bottom. Similar to alternative B, dewatered work zones would be required for construction and demolition activities; however, alternative C would require twice the work because construction of two bridges – the temporary bridge and then the permanent bridge – would be needed to complete the work on the existing alignment. The types of impacts would be the same, including the potential for sedimentation, injury or mortality to aquatic organisms and plants, and disruption or change of the streambed and therefore aquatic habitats. Because the construction and demolition activities would essentially be doubled, the impacts on wetlands would be greater under alternative C. Impacts would be minimized to the extent possible using mitigation measures and BMPs, as discussed for alternative B.

Although alternative C would not completely remove the bridge abutments from the floodplain, they would be moved outside of the current active channel and would be less constrictive. The creek would have a larger area within which to migrate than under current conditions, which would be a benefit to the creek and the plants and organisms that inhabit it.

**Wetland B (Scrub-shrub Wetland) and Wetland D (Forested Wetland).** Impacts on wetlands B and D would be the same as described for alternative B. Although the same area of wetland buffer for each would be cleared for construction (0.2 acre for wetland B and 0.8 acre for wetland D), alternative C would not result in any permanent impacts on the wetland buffer. Alternative C would not have an adverse effect on the functions and values of wetlands B and D.

**Intermittent Streams C, D, and E.** Impacts on streams C, D, and E would be the same as described for alternative B. The areas of stream buffer would be the same as noted for alternative B (0.2, 0.2, and 0.1 acre, respectively); however, alternative C would not result in permanent impacts on these stream buffers.

**Ditch A.** Impacts on ditch A would be the same as described for alternative B.

**Ditch D1.** Replacing culvert D would result in the same amount of permanent impacts on ditch D1 as described for alternative B (0.0009 acre or 40 square feet).

**Ditch D2.** Approximately 0.004 acre (160 square feet) would be cleared for construction activities and about 0.0009 acre (40 square feet) would be permanently affected by replacement of culvert D. Ditch D2 would not need to be completely removed under alternative C due to the lack of an expanded parking area under this alternative.

**Ditch E.** Impacts on ditch E would be the same as described for alternative B.

Overall, alternative C would result in some long- and short-term impacts on wetlands. Permanent loss of wetlands (0.02 acre or 785 square feet) under alternative C would result from replacing the five culverts in the project area. Alternative C would not result in any permanent impacts on wetland buffers. The areas temporarily impacted by construction activities would be revegetated and monitored following construction, as described in the "Soils and Vegetation" section. Although it would take time for wetland functions and values to be restored to current conditions, the area of impact is small compared to the total area of wetlands (1.2 acres) and wetland buffers (10.2 acres) in the project area, so the overall impact on functions and values of the wetlands should also be minimal.

### *Cumulative Impacts on Wetlands*

As discussed in the "Affected Environment" section above, wetlands could be affected by a changing climate, regardless of the alternative. Past, present, and future planned actions in the park that involve ground disturbance in wetlands, changes in drainage patterns or stream flow to wetlands, either via location or amount of water have or could have impacts on wetland communities in the park. The park would continue to implement mitigation measures to reduce adverse impacts on wetlands from these projects, but these impacts would contribute long-term adverse effects on the wetland communities at the park. Several ongoing and future development and infrastructure projects at the park would improve drainage features (e.g., Stevens Canyon Road project, SR-123 project), replace culverts (e.g., Fairfax Forest Reserve Road East project), and monitor and remove overgrowth and invasive species (e.g., routine park maintenance and natural resources management), thus contributing to the long-term beneficial impacts on wetlands. Under alternative A, culverts would not be replaced and temporary flow disruptions that occur when the culverts get inundated or clogged would continue, causing minor impacts on streams and wetlands downstream of the culvert. Wetlands within the project area would remain unchanged; therefore, this alternative would not contribute to cumulative impacts when considered with the ongoing and future projects occurring in the park. However, if there is bridge failure, this would result in a substantial contribution to adverse impacts on wetlands. Alternative B would contribute temporary and long-term impacts on wetlands, but the incremental impacts and effects of this alternative would not make a substantial contribution to the changes in wetlands throughout the park from other ongoing and future projects. Alternative C would also contribute temporary and long-term impacts on the wetlands, although to a lesser degree than alternative B; however, the incremental impacts and effects of this alternative would not make a substantial contribution to the impacts on wetlands throughout the park from other ongoing and future projects.

### *Conclusion for Wetlands*

Alternative A would not alter any wetlands within the project area, although the culverts would continue to become inundated and/or clogged during wet periods. Clogged culverts would have a continuing adverse impact on the stream and wetlands within the project area from restricted flows, excess scour and erosion, and impeded aquatic organism movement. The functions and values of the wetlands, streams, ditches, and Fryingpan Creek would remain the same and would continue to support vegetation and wildlife communities as they do currently. Alternative A would not contribute to cumulative impacts on wetlands (unless the bridge were to fail and collapse). Alternatives B and C would have direct and indirect impacts on wetlands from construction activities that would result in the temporary impacts on and permanent loss of wetlands and their buffers. The impacts of these two alternatives would be similar except for the permanent impacts from realigning Sunrise Road and expanding the formal parking area under alternative B. The placement of new impervious surface would result in the permanent loss of 0.6 acre of wetland buffers and the relocation of ditch D2, which feeds the stream and forested wetland downstream. Both alternatives would result in 0.02 acre of permanent loss of wetlands, streams, and ditches associated with replacing the five culverts. Alternatives B and C would both result in temporary impacts on water quality during construction, but moving the bridge abutments completely out of the floodplain (alternative B) or outside of the current active channel (alternative C) would have a benefit on the creek, as it would allow natural migration of the creek within its channel and the development of a variety of habitats. Similarly, replacing the culverts would represent a small loss of wetlands and have short-term impacts on water quality during construction, but the larger culverts would represent a long-term beneficial impact from improving the hydrology in the project area. Alternatives B and C would contribute incremental impacts and effects, but not make a substantial contribution, to cumulative impacts from other ongoing and future projects.

# Floodplains

## Affected Environment

The natural values of floodplains contribute to ecosystem quality, including groundwater recharge, water quality maintenance, erosion control, biological productivity, fish and wildlife habitats, recreational opportunities, and societal resources, such as harvest of agricultural, aquacultural, and forest products, as well as opportunities for scientific study (Wright 2007).

The floodplain processes in the park are dynamic and complex. The streams and rivers draining Mount Rainier from the numerous glaciers carry large quantities of water, sand, gravel, and boulders. Because of the sediment and debris that these streams carry downstream, the banks and floodplains of streams are extremely unstable. The deposition of glacial sediments from floods and debris flows is the primary cause of channel instability. Because of these instabilities, floodplains continue to change and evolve following each storm or glacial event (NPS 2012).

Floods in the park can occur any time of year from precipitation events, glacial outbursts, and rapid melting of snow and ice. Floods from melted glacial ice typically occur during the summer and fall, and precipitation-induced flooding occurs most frequently in late fall and early winter. Glacial outburst-generated floods are from a sudden release of water from a glacier and are known to occur in the summer and fall (NPS 2012).

Fryingpan Creek, a tributary to the White River, is crossed by Sunrise Road. It is a glacial stream, influenced year-round by glacial meltwater from Fryingpan Glacier, as well as by several smaller nonglacial tributaries (Lofgren and Anderson 2020; Marks et al. 2020) The creek is in a heavily glaciated valley with steep walls (FHWA 2022a). Fryingpan Creek is dynamic, though not as active as some other rivers in the park. The project area is located approximately 2,200 feet upstream of the confluence with the White River at the top of an alluvial fan, a fan-shaped area where water-transported materials (gravel, sand, and smaller sediments collectively called alluvium) are deposited. The continuous and irregular distribution of alluvium within the fan causes the creek to flow in multiple channels over the streambed (FHWA 2021). There is a considerable amount of large woody debris present along the length of Fryingpan Creek, making the transport of woody debris during flood events likely (Marks et al. 2020; FHWA 2021). The streambed is composed mostly of gravel and cobble with scattered boulders. Fryingpan Creek is a fish-bearing stream that provides good habitat overall for fish, though its steep gradient does not allow for the development of some key habitat features, such as pools or side channels (FHWA 2022a).

A formal floodplain delineation has not been performed in the project area; however, FHWA conducted modeling and field verification within the project area to determine the 100-year floodplain. Both abutments of the existing Fryingpan Creek Bridge are within the floodplain (see figure 11) and constrict Fryingpan Creek. Figure 11 shows the approximate boundary of the current 100-year floodplain (solid navy blue line), as well as the extent of the floodplain if the flow was not impeded by the western abutment of the Fryingpan Creek Bridge (dashed navy blue line).

### *Environmental Trends*

Mount Rainier's glaciers are melting faster than they are accumulating due to climate change. Therefore, the rate of aggradation in surrounding rivers has increased. Through aggradation, glacial riverbeds fill with rock from glacial melt. As rivers aggrade, the deposited rocks cause the riverbed to rise, forcing the waterbody to flow higher, and/or in a new direction, creating braided river channels and changing the way the river or stream flows within its floodplain. Climate change is accelerating aggradation, increasing the potential for floods to overtop the banks, affecting adjacent infrastructure, such as roads. Floods are becoming more frequent and more damaging. For example, in places, flow in the Carbon River on the northwest side of Mount Rainier is now higher than the historic road which has now been converted into a multiuse trail. Fryingpan Creek has a glacial source, but the Fryingpan Glacier starts lower on the mountain. In the project area, there is currently no evidence of meaningful aggradation from Fryingpan Creek (NPS 2022b).

## Impacts Assessment for Floodplains

The Fryingpan Creek Bridge project area is located within the 100-year floodplain of Fryingpan Creek, which is a tributary to the White River. The proposed action would result in beneficial impacts on the natural functions of the floodplain, capital investment, and human health and safety by removing the bridge abutments from the current active channel, as described below.

### *Impacts of Alternative A*

Under alternative A, the Fryingpan Creek Bridge would continue to be used with no planned management changes. Although there would be no construction activities, annual safety inspections and routine maintenance activities would continue. The impacts on floodplains from the bridge abutments being in the floodplain within the streambed would continue, as would the occasional replacement of riprap at the abutments to prevent scour. The bridge abutments and the armoring constrict Fryingpan Creek and prevent full natural migration of the creek within its channel. Natural channel migration is a geologic process that occurs over time; it also occurs suddenly following floods or high-water events. Channel migration happens in response to gravity and topography, especially during flooding. Waterbodies gain or release energy as they flow, which can carry sediments or spread them out and build new areas (Washington State Department of Ecology 2022). Constricting channel migration affects the way sediment is deposited upstream and downstream of the abutments, altering the flow, and potentially reducing habitat complexity. Regardless, the floodplain would continue to be able to convey flood flows. Naturally functioning floodplains reduce the amount and the speed of water flowing through the channel, reducing the destructive power of floodwaters by allowing them to spread more broadly across the channel. In addition to impacts on the natural floodplain values, the bridge would continue to be susceptible to potential scour failure due to the location of the abutments in the stream channel. Further, if the Fryingpan Creek Bridge were to deteriorate or fail, the collapsed bridge would result in long-term adverse impacts on floodplains, as the bridge would alter flow in the floodplain and disrupt the natural functions and values of the Fryingpan Creek floodplain by reducing its ability to convey floodwaters.

### *Impacts of Alternative B (Proposed Action/Preferred Alternative)*

With the new bridge on the new alignment under alternative B, the abutments for the new bridge would be placed entirely outside of the current floodplain, improving channel migration opportunities for

Fryingpan Creek. The active waterway width under the bridge would be increased to match the natural widths upstream and downstream, a long-term beneficial effect on the floodplain. Construction and demolition activities would have short-term adverse impacts on the floodplain from establishing dewatered work zones, potential blasting, and the use of tracked equipment in the streambed. These actions would alter hydrology, cause sedimentation, affect water quality, and alter the streambed by compacting sediments and moving small rocks, as discussed in the “Wetlands” section. These impacts would be temporary, lasting for the duration of construction (two to three years), and would be minimized through resource protection measures described in appendix B.

The channel bank east of Fryingpan Creek is a steep slope, and it is currently exposed to river flows and is eroding as it would naturally. The existing east abutment, which extends into the floodplain, provides some protection of the channel bank. By removing the existing bridge abutment, the downstream channel bank may be subjected to increased erosion. To reduce the energy of the flow and provide protection for the channel banks downstream from the abutments, woody debris would be placed along the shoreline downstream of the abutments to redirect floodwaters off the banks.

Riprap would be placed at the base of the abutments to protect the abutments from scour and erosion. The riprap protection for the west abutment would be placed adjacent to the active channel, but it would be buried to grade level, reducing the impacts of the riprap on channel migration. Under normal flow, the riprap would be outside the channel; however, during high flow events, the river would flow over the riprap.

There would be short-term adverse and long-term beneficial effects on floodplains from removing the existing bridge and rehabilitating the portion of the road alignment not used in this alternative. Demolition and removal of the abutments would again require dewatered work zones and the use of tracked equipment, which would have the same impacts as discussed above. Removal of the constructed elements, including the bridge and its abutments, from the floodplain, would allow for more natural channel migration. A naturally functioning waterbody can support a variety of fish, wildlife, and vegetation. Rivers and streams that are not constricted with structures in the floodplain can migrate and are able to develop a high diversity of aquatic habitats (Washington State Department of Ecology 2022). Overall, alternative B would have long-term beneficial impacts on the floodplain.

### *Impacts of Alternative C*

The span of a new bridge on the existing alignment under alternative C would be longer than the existing bridge, allowing the abutments to be placed further apart. This would meet FHWA’s recommendations for the current alignment, reducing constriction of the waterway, and limiting disturbance of the floodplain from the bridge. Although this would be an improvement over the current bridge span of approximately 130 feet, alternative C would not completely remove the bridge abutments from the floodplain. This would result in continued long-term adverse effects on the floodplain because the creek would not be able to move freely within its channel migration zone.

The construction and ultimate demolition of a temporary bridge and road alignment downstream of the existing bridge would have the same impacts as discussed above — altered hydrology, streambed conditions, and water quality parameters. These same impacts would also occur during the removal of the abutments of the existing bridge and construction of the new bridge abutments. Alternative C may be able to be completed in the same time frame as alternative B or it may take longer; however, with the construction and demolition of two separate bridges, the short-term construction-related impacts would have a greater impact on the floodplain. Mitigation measures and monitoring during construction would be implemented to reduce sedimentation and the resulting impacts on downstream water quality. Although alternative C would produce the same types of impacts as alternative B, those impacts would be more frequent within the construction period because there would be more in-water work.

Ultimately, the increased span of the new bridge under alternative C would result in long-term beneficial impacts on the floodplain from a reduction in the constriction of the natural migration of the creek within the channel. The wider span would also reduce the potential for scour of the new bridge abutments, resulting in a longer-lasting bridge with fewer adverse effects on the floodplain.

### *Cumulative Impacts on Floodplains*

As discussed in the "Affected Environment" section above, floodplains could be affected by a changing climate, regardless of the alternative. Ongoing actions that would adversely affect floodplains are those that involve ground disturbance in floodplains, changes in drainage patterns, and change in stream flow, either via location or by the amount of water. The ongoing Stevens Canyon Road and the future Fairfax Forest Reserve Road East projects both include drainage improvements, which would have beneficial impacts on the floodplains within the park. Ongoing development and infrastructure projects at the park (such as the Paradise/Longmire Wastewater Treatment Plans project) would result in permanent adverse impacts on floodplains through the construction of replacement or additional structures in floodplains or increased runoff into the water. The park would implement mitigation measures to reduce adverse impacts on floodplains; however, development projects would contribute long-term adverse effects on the floodplains within the park. Under alternative A, the bridge and road alignment would remain unchanged, but the presence of the abutments would continue to constrict Fryingpan Creek flow. This alternative would contribute to cumulative impacts when considered with the ongoing and future projects occurring near the project area. However, if there is bridge failure, this would result in a substantial contribution to adverse impacts on floodplains. Alternative B would contribute temporary adverse impacts from the removal of the existing bridge and its replacement with a new bridge but long-term improvements to the floodplain by removing infrastructure from the floodplain. Alternative C would contribute short- and long-term adverse impacts and long-term beneficial impacts on the floodplain. The incremental impacts and effects of alternatives B and C would not make substantial contributions to the changes in floodplains from other ongoing and future projects.

### *Conclusion for Floodplains*

Alternative A would continue to have adverse impacts on the floodplain from the bridge abutments being located within the active channel, constricting the natural migration of Fryingpan Creek within the stream channel. The existing bridge would also continue to be at risk of failure due to scouring. Alternatives B and C would reduce these impacts by lengthening the span of the bridge. Constructing the bridge abutments outside of the current floodplain slightly downstream of the existing bridge in alternative B would reduce the risk of scour and restore the ability of Fryingpan Creek to naturally migrate within the stream channel. The abutments for the new bridge under alternative B would be completely outside of the floodplain, though the riprap armoring would be within the floodplain. The new bridge on the existing alignment under alternative C would maximize the span of the bridge based on the limitations of the existing topography and geology, allowing the abutments to be placed further apart. Although the abutments would not be completely out of the floodplain, alternative C would have some beneficial impacts on floodplains compared to current conditions. Alternative B and C would continue to contribute to the cumulative impacts from the presence of the abutments on the edge of, but not within Fryingpan Creek. By fully removing the abutments from the active channel, alternative B would provide the most beneficial effects on floodplains compared to current conditions.

# Special Status Species

## Affected Environment

The habitats within the park support a wide diversity of fish and wildlife species. Approximately 60 mammalian, 158 avian, 14 amphibian, 5 reptile, and 15 fish species are known to occur within the park (NPS 2022c). Among these are a number of special status species. The NPS obtained a preliminary list of endangered species and critical habitat expected to be in or near the project area. The list included the following 11 species: bull trout (*Salvelinus confluentus*), steelhead (*Oncorhynchus mykiss*, Puget Sound distinct population segment), Chinook salmon (*O. tshawytscha*, Puget Sound evolutionarily significant unit [ESU]), northern spotted owl (*Strix occidentalis caurina*), marbled murrelet (*Brachyramphus marmoratus*), yellow-billed cuckoo (*Coccyzus americanus*), Mount Rainier white-tailed ptarmigan (*Lagopus leucura rainierensis*), gray wolf (*Canis lupus*), North American wolverine (*Gulo luscus*), monarch butterfly (*Danaus plexippus*), and whitebark pine (*Pinus albicaulis*). As noted in appendix A, yellow-billed cuckoo, Mount Rainier white-tailed ptarmigan, monarch butterfly, and whitebark pine were not carried forward for full analysis due to a lack of habitat in the project area. The project area also contains essential fish (EFH) habitat for pink salmon (*O. gorbuscha*), Chinook salmon, and coho salmon (*O. kisutch*), as well as suitable habitat for several amphibian species, including western toad (*Bufo boreas*), Cascades frogs (*Rana cascadae*), coastal tailed frogs (*Ascaphus truei*) and coastal giant salamanders (*Dicamptodon tenebrosus*), which are considered park-sensitive species.

The park consults with six federally recognized tribes located in its vicinity — Muckleshoot Indian Tribe, Puyallup Tribe of Indians, Cowlitz Indian Tribe, Squaxin Island Tribe, Nisqually Indian Tribe, and the Yakama Indian Nation. The tribes are interested in the fish and their habitat within the project area. The Puyallup Tribe of Indians, through their fisheries department, is also actively working to preserve, protect, and enhance salmon populations in the Northwest, including the White and Puyallup River watersheds originating on Mount Rainer. The Tribe leads and participates in habitat restoration efforts, harvest management and policy, fish enhancement, and recovery projects, as well as research and monitoring activities (Marks et al. 2020). Fish and fish habitat are known ethnographic resources.

### *Bull Trout*

The bull trout is federally listed as a threatened species and is a candidate for listing by the State of Washington. Bull trout exhibit both resident and migratory life-history strategies. Resident bull trout complete their life cycles in the streams in which they spawn and rear. Migratory bull trout spawn in tributary streams where juvenile fish rear for one to four years before migrating to either a lake (adfluvial form), river (fluvial form), or saltwater (anadromous form) to rear as subadults and to live as adults.

Bull trout spawning occurs primarily during the month of September; however, spawning has been observed from the last week of August through the first week of October (Marks et al. 2021; Lofgren and Anderson 2020). Preferred spawning habitat consists of low-gradient stream reaches with loose, clean gravel. Redds, or nests, are often constructed in stream reaches fed by springs or near other sources of cold groundwater. All life history stages of bull trout are associated with complex forms of cover, including large woody debris, undercut banks, boulders, and pools. Juvenile and adult bull trout frequently inhabit side channels, stream margins, and pools with suitable cover (USFWS 1999). In the Puget Sound region, over 1,700 miles of streams and shorelines are designated as bull trout critical habitat, including many streams within the park. Approximately 1.7 miles of Fryingpan Creek is designated as critical habitat for bull trout.

Fryingpan Creek within the project area provides important spawning and rearing habitat for bull trout, providing habitat for multiple life stages (fluvial and resident). Fryingpan Creek has been identified as one of five high-use spawning streams in the White River watershed that is known for high-quality fish habitat and cool water refugia due to glacial contribution (Lofgren and Larson 2023). The Fryingpan Creek watershed supports a varied population of bull trout. Resident bull trout are found in smaller headwater tributaries, including Fryingpan Creek, while migratory bull trout frequently travel long distances; using the mainstem rivers and larger tributaries to forage and overwinter. During the fall, migratory forms of bull trout travel downstream from spawning and foraging habitats towards foraging and overwintering habitats located lower in the river system. Beginning in spring and early summer, they begin the return journey back to spawning and rearing areas high in the watershed (Lofgren and Anderson 2020). The bull trout populations in Fryingpan Creek were sampled in 2019. This study provided an estimated population of 844 bull trout larger than 3.9 inches (100 millimeters), indicating that the density of bull trout in Fryingpan Creek is high (Johnson 2021).

**Environmental Trends.** Bull trout and their habitat face a number of issues, including damming and water diversions, deforestation of riparian areas, dewatering and low instream flow regimes, significant channel manipulation, competition with nonnative species, and climate change. These issues can result in barriers to habitat connectivity and migration corridors, reduced water quality, changes in flow regimes, scour effects, thermal variations, and changes in water chemistry (Marks et al. 2020). Climate may be a key factor in limiting the geographic distribution of bull trout. Climate change has the potential to greatly reduce habitable streams for bull trout (Ford 2011).

### *Puget Sound Steelhead*

The Puget Sound steelhead is federally listed as a threatened species and is a candidate for listing by the state of Washington. Steelhead are anadromous forms of rainbow trout that migrate to the ocean for growth to a larger size before returning to natal streams to spawn. As they migrate to the sea, they may occur within the project area. Steelhead critical habitat in the White River extends to a point 11.3 miles below the Fryingpan Creek Bridge (NOAA 2016). Steelhead have not been identified in the White River within the park boundary. The Washington Department of Fish and Wildlife Salmonscape database identifies the presumed presence of steelhead to a point approximately one mile downstream of Fryingpan Creek. Steelhead stock are primarily winter-run, peaking in April and May. However, a few summer-run strays have been caught in August and September. While steelhead have not been documented in the vicinity of Fryingpan Creek, they may be present, as they tend to move upstream in smaller streams.

**Environmental Trends.** Steelhead occupies similar habitat to bull trout and therefore environmental trends affecting steelhead and its habitat would be the same as those for bull trout.

### *Puget Sound Chinook Salmon*

Chinook salmon are the largest of the Pacific salmon. There are two distinct stocks of this anadromous species present in the Puyallup/White River system —the White River Spring Chinook (springer or spring-run) and Puyallup River Fall Chinook (fall or fall-run) — and Chinook in the park are both wild and hatchery-origin (Marks et al. 2020). The Puget Sound Chinook salmon ESU is listed as a federally threatened species, and designated critical habitat for this species in the White River extends to a point 9.6 miles downstream of the Fryingpan Creek Bridge (NOAA 2005). Chinook salmon inhabit major river systems throughout the Puget Sound and commonly migrate to the ocean as young of the year or yearling juveniles, rearing first within natal estuaries and then along nearshore marine habitats, foraging to gain size for greater survival before migrating to open ocean (Groot and Margolis 2003).

Chinook stocks in the Upper White River include the Puget Sound unique stock of spring Chinook, along with the more common but smaller run of fall Chinook. These early migrating adult stocks are the only existing spring-run Chinook in Puget Sound. The upstream migrating adult spring Chinook enter the White River in April and spawn in both the upper and lower White River (Marks et al. 2020). The spawning site selection and remaining freshwater lifecycle generally remains the same as for fall-run Chinook. Spring Chinook are particularly important in the upper White River as they are the "only Spring Chinook stock existing in the Puget Sound region and are unique due to their genetic and life history traits" (Marks et al. 2021). Park data indicates that juvenile Chinook have been documented in the upper White River at the park boundary (Lofgren and Anderson 2020), and the Washington Department of Fish and Wildlife Salmonscape database identifies the presumed presence of Chinook to a point approximately one mile downstream of Fryingpan Creek.

**Environmental Trends.** Salmonids throughout the Pacific Northwest are likely affected by climate change. Several studies have revealed that climate change has the potential to affect ecosystems in nearly all tributaries throughout the state (ISAB 2007; Battin et al. 2007). The largest driver of the climate-induced decline in salmonid populations is projected to be the impact of increased winter peak flows, which scour the streambed and destroy salmon eggs (Battin et al. 2007). Higher water temperatures and lower spawning flows, together with the increased magnitude of winter peak flows, are all likely to increase salmonid mortality.

### *Essential Fish Habitat*

The Magnuson-Stevens Fishery Conservation and Management Act requires cooperation among the National Marine Fisheries Service, the Fishery Management Councils, and federal agencies to protect, conserve, and enhance EFH. Congress defined EFH for federally managed fish species as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" (Pacific Fishery Management Council 2014). The Pacific Fishery Management Council manages the fisheries for Chinook, coho, and pink salmon and has defined EFH for these three species. Salmon EFH includes all those streams, lakes, ponds, wetlands, and other water bodies currently or historically accessible to salmon in Washington, Oregon, Idaho, and California. Park rivers and streams are included in the habitat associated with Chinook, coho, and pink salmon. The project area is within EFH for Chinook, coho, and pink salmon. These species have not been detected within the project area but have been detected spawning in tributary streams in the White River watershed just within the park boundary (Lofgren and Anderson 2020). Chinook salmon are described in the previous paragraphs; the paragraphs below provide a brief description of coho and pink salmon.

**Coho Salmon.** Coho salmon are anadromous, migrating up rivers from the sea to spawn. The coho salmon in the park are both wild and hatchery-origin. The majority of wild coho juveniles rear in freshwater for approximately 18 months before migrating to marine waters. Adult coho enter the lower Puyallup River system in early August and continue to move through the watershed as late as February/early March. The majority of spawning occurs from mid-September through late December, with peak spawning occurring between late October and early November (Marks et al. 2020). Coho salmon are rarely encountered in the park but are present in the White, West Fork, Puyallup, Mowich, and Carbon watersheds (NPS 2022d). NPS and Puyallup Fisheries staff have observed coho salmon at Hidden Springs, approximately 4 miles downstream of the project area (Marks et al. 2022).

**Pink Salmon.** Pink salmon are anadromous; however, unlike coho and Chinook salmon, this species spends little time in freshwater. The fry migrate directly to estuarine and marine waters soon after hatching (NOAA 2022c). Pink salmon in the Puyallup/White River system return every other year to spawn. Pink salmon enter the river as early as mid-July and spawn from late-August through mid-November with peak spawning occurring from late September to early October. They typically spawn in low-elevation, low-gradient rivers relatively close to the ocean (NPS 2022d). Fry emerge from late fall through winter and migrate from February to June, with the peak out migration occurring at the end of March (Marks et al. 2020). Pink salmon can be found within the park during the fall spawning season in the lowest elevations of the White River watershed, near the park boundary (NPS 2022d). Puyallup Tribal Fisheries staff have observed pink salmon as high up in the White River as Sunrise Creek, approximately 9 miles downstream of the project area.

**Environmental Trends.** Environmental trends affecting coho and pink salmon would be the same as those for Chinook salmon, described in the previous section.

### *Amphibians*

Fourteen amphibian species (four frogs, one toad, and nine salamanders) have been identified as present in the park (Lofgren and Anderson 2020). The project area contains a variety of aquatic habitats, as described in the "Wetlands" section, that provide breeding and non-breeding habitats for amphibians. Sunrise Road is also used as a travel corridor in wet conditions. Surveys of the project area have noted the presence or potential presence of western toads, Cascades frogs, coastal tailed frogs, and coastal giant salamanders.

**Western Toad.** Western toad is a candidate species for listing in Washington. Western toads use a variety of terrestrial habitats and typically breed in spring (April and May) in permanent aquatic habitats, such as wetlands, lakes, ponds, and river edges. Juvenile toads disperse from breeding grounds in groups and are known to travel along riparian corridors (WDFW 2022b; Lofgren and Anderson 2020). Fryingpan Creek appears to be a travel corridor for juvenile western toads, a federal species of concern, based on more than two years of opportunistic surveys. A July 2020 survey detected recent toad metamorphs (the intermediate stage between tadpole and juvenile) and one-year-old juveniles within the Fryingpan Creek corridor from near the confluence with the White River to the confluence with Wright Creek. Western toads have also been observed under and near the Fryingpan Creek Bridge. These juvenile toads likely originate from the Littorals Pond, the only known western toad breeding site in the area (Lofgren and Anderson 2020).

**Cascades Frog.** Cascades frog status is currently under review by the US Fish and Wildlife Service (USFWS) to determine if listing is warranted under the ESA. Cascades frogs are strongly associated with aquatic habitats in open or patchy coniferous forests such as wet mountain meadows, sphagnum bogs, ponds, lakes, and streams. This species breeds between March and August following ice and snow melt (NatureServe 2022b). A survey of the project area in 2020 identified one adult Cascades frog in the forested wetland adjacent to Fryingpan Creek (wetland D) and one juvenile Cascades frog in a discrete channel of Fryingpan Creek. Wetland D likely provides non-breeding habitat for Cascades frog, as no eggs or larvae for any amphibian species were identified. The channel of Fryingpan Creek in which the Cascades frog was found is fed by groundwater and could provide suitable breeding habitat at times of higher flow (Lofgren and Anderson 2020).

**Coastal Tailed Frog.** The coastal tailed frog is considered a Mount Rainier Species of Concern and is recommended for continued monitoring. This species is associated with cold, clear, rocky streams in mature forests. Coastal tailed frogs can be found in fast-flowing streams in all life stages (WDFW 2022c). Stream D, which feeds wetland D, provides potential breeding habitat for coastal tailed frogs. Although frogs have not been identified in stream D, this species is most active at night and could be present (Lofgren and Anderson 2020).

**Coastal Giant Salamander.** Coastal giant salamanders live in mountain streams in moist coniferous forests and breed in smaller flowing waterbodies. Although they are typically found at elevations below 3,150 feet, they can also inhabit areas at higher elevations (WDFW 2022d). Similar to the coastal tailed frog, coastal giant salamanders have not been observed in the project area, as they are more active at night, but stream D provides potential breeding habitat (Lofgren and Anderson 2020). The coastal giant salamander is a park species of concern.

**Environmental Trends.** Climate change can affect the aquatic habitats the amphibians rely on for all life stages. Changes in precipitation and altered hydrology could reduce habitat and create barriers to movement (WDFW 2022b). Other factors that could affect amphibians include development, habitat fragmentation, and other management practices that alter the riparian or aquatic zones of streams, especially those that change the moisture regime, increase stream temperature, increase sediment load, reduce woody debris input, and change stream bank integrity (WDFW 2022b, 2022c, 2022d; Lee et al. 2015; NatureServe 2022b).

### *Northern Spotted Owl*

The northern spotted owl (spotted owl) is federally threatened and listed as endangered by the state of Washington. The spotted owl is strongly associated with structurally complex old growth forests. Suitable habitat has multiple canopy layers and contains trees of a variety of species, sizes, and ages, including standing and downed dead trees. Nest trees include Douglas-fir, grand fir, Pacific silver fir, and other species. Nests are usually found in forests up to 4,800 feet in elevation. Spotted owls require large amounts of suitable habitat, with median home ranges typically about 3,000 to 5,000 acres per pair of owls. Spotted owls nest in cavities or platforms in trees, and pairs are typically spaced about 1 to 2 miles apart. The northern spotted owl nesting and fledging season is from March 15 through September 30. The breeding season is divided into an early season of March 15 to July 31 and a late season of August 1 to September 30.

The park contains approximately 80,000 acres of suitable spotted owl habitat (NPS 2020a), and the entire project area is within mapped suitable spotted owl habitat. Based on a tree survey conducted during the summer of 2022, the project area contains approximately 3,000 trees, including 260 trees with a DBH of 18 inches or more. These old, mature trees contain habitat elements, such as shaded roosting sites, foraging habitat, and dispersal habitat, which could potentially be used by spotted owls. The project area is within suitable breeding habitat for spotted owls, and Sunrise Road is one of those surveyed during annual monitoring efforts (NPS 2020a). Critical habitat for spotted owls has been designated on national forest lands in Lewis and Pierce Counties, Washington, but no critical habitat has been formally designated in the park because it was presumed to be protected (USFWS 2008).

Surveys for spotted owls have been conducted annually in the park since 1997 as part of an ongoing spotted owl demographic study (NPS 2020a). No spotted owl nesting attempts were documented at the park in 2021 (NPS 2021a). Only a single male was detected. NPS survey and monitoring efforts have identified barred owls (*Strix varia*) occupying many of the spotted owl territories in the park. In 2022 a single spotted owl (sex unknown) was detected in the park at a site located southeast of Mount Rainier. Although the habitat in or near the project area has not been used for nesting recently, juvenile or adult spotted owls could use this habitat for foraging or roosting.

**Environmental Trends.** Impacts from current park activities on spotted owls could include disturbance from recreational use or maintenance activities at the project locations within the elevation range for northern spotted owls or helicopter flights over suitable habitat for search and rescue or other operational needs. Although timber harvest does not occur at the park, habitat loss in the park due to wildfires may increase in the future due to climate change (Wan et al. 2019). Recent studies found spotted owl occupancy declined by 50% between the years 1997 and 2016 and provided evidence that spotted owls have declined in the park due to competition with barred owls (Strix varia) (Mangan et al. 2019).

### Marbled Murrelet

The marbled murrelet (murrelet) is federally threatened and listed as endangered by the state of Washington. The murrelet is a small (10 inches in length) seabird. Murrelets forage in sheltered near-shore waters and are year-round residents of coastal areas from northern California north to Alaska. Murrelets typically nest high in the canopy of old growth forests or stands of large trees infected with mistletoe, typically below 3,800 feet in elevation, and make daily inland-to-sea migrations. Critical habitat for the species has been designated in Lewis and Pierce Counties, but the designation does not include the park (NPS 2021b).

The park contains approximately 26,500 acres of potential murrelet nesting habitat. High-quality habitat is distributed along the western boundary of the park in valleys running east and west, separated by high-elevation ridges. Lower-quality suitable habitat continues along the southern and southeastern areas of the park. Within the park, murrelets have been documented in four river corridors—Carbon, Mowich, Puyallup, and Nisqually. Marbled murrelet nesting activity is documented by radar detection, but monitoring has been limited to the Carbon and Nisqually river drainages. No active nests have been identified in the park. The closest mapped murrelet habitat in the park is located approximately 1 mile northeast of the project area. Although the forest in the project area provides suitable habitat — conifer-dominated stands with suitable nesting structures — the distance to marine waters and the elevation of the project area limits the potential for use by murrelets (NPS 2021b).

Marbled murrelets in western Washington and the park actively nest from April 1 through September 23. The murrelet is thought to be most vulnerable to noise disturbance during the breeding season when adults are producing and incubating eggs (NPS 2021b).

**Environmental Trends.** Impacts from current park activities on murrelets are the same as those described for northern spotted owls, except that marbled murrelets do not face competition from barred owls or other species.

### Gray Wolf

The gray wolf is a federal and state-listed endangered species. Wolves use a broad range of habitats, as long as there is an abundance of prey (USFWS 1987). The key elements of wolf habitat include a sufficient year-round prey base, suitable denning, and rendezvous sites for raising young, and minimal exposure to humans. Ungulates are the primary prey, including elk (*Cervus elaphus*), mule deer (*Odocoileus hemionus*), and moose (*Alces alces*). Alternate prey includes ground squirrel, snowshoe hare (*Lepus americanus*), grouse, and beaver (*Castor canadensis*). Wolves cover large areas for prey and may travel 30 miles in a day. Territory size ranges from 25 square miles to more than 1,500 square miles, depending on prey availability and seasonal movements of prey (USFWS 2022).

Gray wolves were nearly eradicated from Washington state in the early 1900s due to conflicts with humans as ranching and farming expanded into the west. Although no reintroduction efforts have been undertaken by federal or state agencies, wolves are returning to Washington, migrating from adjacent populations in Idaho, Montana, Oregon, and British Columbia (WDFW 2022e). Washington state has ample habitat suitable for wolves (Cleland 2013), and areas surrounding the park have been identified as areas with very high suitability for wolf packs (Mesler 2015). The nearest known established wolf pack in Washington is the Teanaway pack located near Cle Elum (WDFW et al. 2019), approximately 37 miles from the project area. A recent large mammal survey noted the presence of elk and deer near the project area (Cascades Carnivore Project 2022), which provides foraging opportunities for wolves. Although the NPS has not identified any wolves within the park, there are suitable habitat and prey species.

**Environmental Trends.** Human-wildlife conflict continues to be the greatest threat to gray wolves. Habitat loss is also a concern, as wolves need large areas away from human disturbance that also support suitable prey species.

### *North American Wolverine*

The North American wolverine is proposed as a federally threatened species and is a candidate for listing in Washington as state endangered, threatened, or sensitive. Wolverines inhabit upper montane forest, subalpine habitat, and alpine zones in the park and have large home ranges of up to 770 square miles. Wolverines use caves, rock crevices, fallen trees or tree roots, thickets, or similar sites as dens (Cascades Carnivore Project 2022; WDFW 2022f; NatureServe 2022c). Densities of wolverines are low in North America, ranging from 0.3 to 6.2 wolverines per 600 square miles, depending on the quality of the habitat (NPS 2020b). Wolverines are generally opportunistic feeders and can rely on a variety of food types, including carrion, small animals and birds, fruits, berries, and insects, using their keen sense of smell to detect food sources deep beneath snow (Hornocker and Hash 1981).

In 2020, wolverine reproduction was documented in the park for the first time. Trail cameras and scat collection have identified six individual wolverines in the park and adjacent areas of the Okanogan Wenatchee National Forest across SR123 and Highway 410. Research by the Cascades Carnivore Project has identified the project area as a site with high potential for use by wolverines because it is a natural drainage located between high-quality habitat (Cascades Carnivore Project 2022).

**Environmental Trends.** Major threats to the wolverine include habitat loss, degradation, and fragmentation. Roads also pose a threat to wolverines, as they disperse over great distances. Highways and roads are a source of wolverine mortality. Recently, one wolverine was struck and killed by a car on a highway east of the park, and a different male was killed on I-90 (Cascades Carnivore Project 2022). Climate change is also likely to adversely alter wolverine habitat. Wolverines depend on springtime snow cover to shelter their young. Reductions in this snow cover could imperil wolverines' success in raising their young. Further, wolverines may not be able to tolerate increasing summer temperatures (Peacock 2011).

## Impacts Assessment for Special Status Species

In this section, the impacts on special status species from the three alternatives are analyzed. Construction activities associated with the Fryingpan Creek Bridge project could cause direct and indirect impacts on special status species through habitat removal, disturbance, and physical harm. All work would be completed in compliance with the in-water work windows and follow all avoidance, minimization, and conservation measures resulting from USFWS and National Marine Fisheries Service ESA consultation. The NPS is proposing an in-water work window of June 15 through August 15, but the actual window would be subject to ESA consultation.

### *Impacts of Alternative A*

Under alternative A, there would be no new impacts on special status species. However, the existing bridge abutments would continue to alter aquatic habitat by restricting natural channel migration and habitat complexity. The bridge in its current condition would continue to have impacts on water quality from the lead-based paint flaking into the water. Routine maintenance activities would continue to have short-term impacts from noise related to the use of equipment. There is also the potential that the bridge would fail, thus having impacts on habitat or causing injury or mortality to individuals, degradation to water quality, and obstruction to the movement for both aquatic and terrestrial species that use Fryingpan Creek as habitat and/or a migration path.

**Bull Trout.** The ongoing impacts on the floodplain that alter the aquatic habitat in turn adversely affect bull trout and bull trout critical habitat. In addition, if the Fryingpan Creek Bridge were to fail, the collapsed bridge would result in long-term adverse impacts on bull trout and bull trout habitat, as described in the previous paragraph. For this reason, alternative A *may affect and is likely to adversely affect* bull trout and *may affect and is likely to adversely affect* designated bull trout critical habitat.

**Puget Sound Steelhead and Puget Sound Chinook Salmon.** Although steelhead and Chinook salmon have not been documented in the vicinity of the Fryingpan Creek Bridge, their presence may be possible. Impacts on these species would be the same as those described for bull trout. Alternative A *may affect and is likely to adversely affect* Puget Sound steelhead and Puget Sound Chinook salmon. Due to the distance from the project area to the critical habitat of steelhead and Chinook salmon (11.3 and 9.6 miles downstream of the Fryingpan Creek Bridge, respectively), alternative A *may affect but is not likely to adversely affect* designated Puget Sound steelhead and Puget Sound Chinook salmon critical habitat.

**Essential Fish Habitat.** Potential impacts on designated EFH for Chinook, coho, and pink salmon would be the same as described for bull trout habitat and include impacts on the aquatic habitat from the bridge abutments constricting the floodplain, water quality impacts from lead paint chips falling into the water, and water quality and obstruction of the free-flowing creek from potential bridge failure. Based on this information, alternative A would continue to have an adverse effect on EFH for Chinook, coho, and pink salmon.

**Amphibians.** Western toads and Cascades frogs would continue to use Fryingpan Creek and wetland D west of the creek, and the stream that feeds wetland D would continue to provide potential spawning habitat for coastal tailed frogs and coastal giant salamanders. However, the ongoing impacts on the floodplain that alter the aquatic habitat would in turn adversely affect amphibians of conservation concern within the project area. In addition, if the bridge were to deteriorate further or fail, it could result in long-term adverse impacts on the western toad, which uses the creek as a migration corridor, and the Cascades frog, which uses the habitat provided by the creek.

**Northern Spotted Owl.** Although the project area provides suitable habitat for spotted owls, no owls have been detected in the area for many years. Alternative A would not result in any new impacts on northern spotted owls. This alternative would not result in any meaningful spotted owl habitat modification during routine maintenance activities. However, noise from maintenance and continued recreational use in the project area could continue to disturb spotted owls roosting, foraging, or dispersing through the project area. Over time, if the bridge were to collapse, it would result in a short-term impact on spotted owls from noise disturbance but would not have long-term impacts on spotted owls or their habitat within the project area. Alternative A *may affect but is not likely to adversely affect* northern spotted owls.

**Marbled Murrelet.** Alternative A would not have any new impacts on marbled murrelets. Although this species has not been documented in the project area, murrelets could be using habitats in or surrounding the project area and could continue to be disturbed by noise from routine maintenance and recreational use. Similar to spotted owls, failure of the bridge could result in short-term noise disturbance but would not result in long-term impacts on murrelet habitat. Alternative A *may affect but is not likely to adversely affect* marbled murrelets.

**Gray Wolf.** No new impacts on gray wolf would occur under alternative A. Noise from routine maintenance and recreational use could deter wolves from using the project area during certain times, but these noise events are already occurring and would not increase. If the bridge were to deteriorate to the point of collapse, this could affect how wolves or their prey species navigate the habitat in the project area but, as these species are very mobile, would not likely exclude the grey wolf from using the project area. Alternative A *may affect but is not likely to adversely affect* gray wolves.

**North American Wolverine.** Alternative A would not have any new impacts on the Northern American wolverine. This alternative would not result in any habitat loss but could affect dispersing wolverines due to noise associated with routine maintenance and recreational activities. If wolverines are moving through or near the project area, they are likely avoiding times of higher noise, though there is little known about the effects of human activities on wolverines. Similar to gray wolves, if the bridge were to fail and collapse over time, it could affect how wolverines move through the area, but it would not exclude them from using the project area. Alternative A *will not jeopardize the continued existence* of North American wolverine.

### *Impacts of Alternative B (Proposed Action/Preferred Alternative)*

Alternative B would have impacts on special status species through vegetation clearing, in-water work, and construction noise. For the construction of the bridge on a new alignment slightly downstream, approximately 2.3 acres within the 7.5-acre project area would be cleared and would include mature coniferous forest, steep shrubland, and roadside edge habitat, as described in the "Soils and Vegetation" section. Clearing would include the removal of up to 925 trees with approximately 80 having a DBH of 18 inches or greater. Among these trees are six trees of conservation concern (four silver firs, one Douglas-fir, and one western hemlock) due to their size and presence of branch structures that may be suitable for use as murrelet nesting platforms. New impervious surface under this alternative for the new road and expanded parking area would result in a permanent loss of 0.6 acre. Although much of the area disturbed for construction would be revegetated, restoration of the existing natural conditions would take decades to establish mature vegetation and the restored areas would not replicate the habitat lost. Because of this, the entire 1.7 acres of mature coniferous forest cleared for alternative B would be considered a permanent loss.

Dewatered work zones are needed to install temporary bridge supports during the construction of a new bridge, install the new bridge abutments, and remove the abutments of old and temporary bridges. These activities would have impacts on aquatic species, including the potential for exclusion from these areas, potential avoidance of the project and adjacent areas, degradation of water quality in downstream areas, potential injury, mortality, or disruption of natural behaviors from handling during removal from the isolation zones, and damage to redds and eggs.

In 2021, Sunrise Road received an annual average daily traffic volume of 661 vehicles per day based on data received from the permanent traffic counter located on Sunrise Road near the intersection with SR 410/Mather Memorial Parkway (FHWA 2022b). This is considered generally light traffic and measures about 50 dBA at 100 feet. Also contributing to the soundscape in the project area are the sounds of the flowing creek, which typically measures approximately 40 dBA at 100 feet.

Construction would be performed in a series of steps or phases, and noise associated with different phases would vary greatly. Appendix D presents a list of the equipment that could be used during construction and demolition activities, as well as the noise that each type of equipment generates. The maximum sound levels experienced from 50 feet from heavy equipment range from about 76 to 90 dBA for non-impact equipment (e.g., excavator, dump truck) and 79 to 101 dBA for impact equipment (e.g., impact pile driver, jackhammer) (FHWA 2006). The project may require blasting to construct the new bridge abutments. Blasting would generate the loudest noise during construction activities. As stated previously, at 230 feet from the blast site, the peak sound level from blasting is expected to be 116.9 dBA (NPS 2021c). Dense vegetation can reduce noise levels by as much as 5 dB for every 100 feet of vegetation. Topography change can also reduce noise levels, and environmental factors, such as wind and water, can mask some of the construction noise (NRC 2012).

Noise is also a concern in aquatic environments. The movement of noise within a waterbody is dependent on whether a sufficient water column is present to transport the noise. The flow of Fryingpan Creek is variable throughout the year and water levels may be low enough such that noise may not extend very far from the source, and noise would also not travel around bends in the creek. However, construction-related noise would be experienced within the extent of Fryingpan Creek within the project area.

**Bull Trout.** Alternative B has the potential to affect bull trout and designated critical habitat during construction activities, primarily through in-water work and blasting activities. Prior to in-water work, dewatered work zones would be established so that construction equipment could access the site. Before the zones are dewatered, fish would be removed by methods such as hand or dip-nets, seining, or trapping, consistent with measures identified through the ESA Section 7 consultation process. See the "Construction Activities" section in chapter 2 for more details. Handling fish can result in a variety of stress responses, including increased vulnerability to predators and mortality, suppressed immune systems, and decreased growth, swimming performance, or reproductive capacity (Portz, Woodley, and Cech 2006). Fish that remain in the creek near the work isolation zones would be exposed to changes in the water quality from the movement of the construction equipment in the water, blasting activities, and debris that may fall into the creek. These actions could potentially result in changes in sedimentation and scouring, unintentional release of contaminants from construction vehicles and equipment, and accumulation of debris from the existing bridge into Fryingpan Creek. Dewatered work zones and in-water work would also create localized changes in hydrology and alter the streambed by compacting sediments and moving small rocks, as discussed in the "Wetlands" section. These impacts on bull trout habitat would be short-term (duration of construction) and would be reduced to the extent possible with the implementation of the resource protection measures described in appendix B.

Exposure to blast-related turbidity and debris can cause short-term effects on fish, such as stress and injury. Blasting activities have the potential to kill or injure adult, subadult, and juvenile fish. Temporary exposures to turbidity plumes may also disrupt normal fish behaviors (e.g., the ability to successfully feed, move, and/or shelter). These exposures may temporarily cause fish to avoid the project area, may impede or discourage free movement through the action area, prevent individuals from using preferred habitats, and/or expose individuals to less favorable conditions. The seasonal timing for blasting would occur within the recommended in-water work window determined through consultation to avoid direct impacts on bull trout.

Blasting can also affect fish habitat. Blasting for the bridge abutments would take place outside of the active stream channel, but could affect streambanks, including removal or damage to streamside vegetation and removal of streambank materials. These streambank modifications may remove some vegetation and materials, but the impacts would be limited and would not be expected to result in changes to water temperature from increased sun exposure. Accumulation of rock material during blasting would occur, potentially altering fish habitat in the project area; however, this would be limited with the implementation of resource protection measures.

Operation of the new bridge and road alignment under alternative B would be beneficial to bull trout and its critical habitat. The longer span of the bridge under this alternative would allow the bridge abutments to be constructed outside of the floodplain. This design would reduce the constriction of the floodplain, allowing Fryingpan Creek to migrate naturally within the channel, which is important to aquatic habitat and natural diversity.

Construction activities under alternative B could have direct and indirect adverse impacts on water quality and bull trout habitat. These impacts would be limited to the extent possible with the implementation of resource protection measures; however, alternative B *may affect and is likely to adversely affect* bull trout. Over the long term, removing the bridge abutments from the active channel bed would be beneficial for bull trout, but due to the extensive instream work and the potential for turbidity, alternative B *may affect and is likely to adversely affect* designated bull trout critical habitat.

**Puget Sound Steelhead and Puget Sound Chinook Salmon.** Although steelhead and Chinook salmon have not been documented in the vicinity of the Fryingpan Creek Bridge, their presence may be possible. As such, direct effects on steelhead and Chinook salmon that may be near the project and their habitat would be the same as those described for bull trout. Alternative B *may affect and is likely to adversely affect* Puget Sound steelhead Chinook salmon. Due to the distance from the project area to the critical habitat of steelhead and Chinook salmon (11.3 and 9.6 miles downstream of the Fryingpan Creek Bridge, respectively), alternative B *may affect but is not likely to adversely affect* designated Puget Sound steelhead and Puget Sound Chinook salmon critical habitat.

**Essential Fish Habitat.** The impacts on designated EFH in the project area would be similar to those discussed above for bull trout habitat. There would be adverse impacts on water quality due to the potential for turbidity at multiple times during construction activities. Turbidity impacts would remain relatively localized, as all but the finest suspended sediments have been shown to fall out of downstream waters within about 0.5 mile of a construction site (NPS 2019). Operation of the new bridge would span the floodplain and therefore no longer constrict the natural movement of the creek. Restoring the natural floodplain by removing the bridge abutments from the floodplain would be a long-term benefit to EFH. Alternative B would have an adverse effect on EFH for Chinook, coho, and pink salmon. Because the turbidity impacts would be spatially limited and temporary and resource protection measures would be implemented, overall impacts to EFH would be limited in scope and duration.

**Amphibians.** Impacts on the aquatic resources within the project area under alternative B could affect amphibians of conservation concern. As discussed in the “Wetlands” section, there would be temporary and permanent impacts on the buffer of the forested wetland adjacent to Fryingpan Creek (wetland D) and on intermittent stream D that feeds the wetland. Clearing of vegetation within the buffers of the wetland and the stream could alter the vegetation communities of the buffers but would not have a meaningful impact on the aquatic habitats. During the construction of the parking area, the roadside ditch that is connected to stream D via a culvert would be replaced with an appropriate drainage feature to better convey water across the road prism. Although there would be adverse impacts, the larger culvert would provide improved hydrology in stream D and wetland D over the long-term, which could benefit the Cascades frog, coastal tailed frog, and coastal giant salamander.

Blasting activities and in-water work would have adverse impacts on western toads and Cascades frogs, as they inhabit Fryingpan Creek and use the creek as a migration corridor. These impacts would be similar to those described for fish — change in habitat conditions, injury or mortality, disruption of normal behaviors, disruption of movement, and avoidance of the project area. The window for blasting (June 15 to August 15), could align with the time that juvenile western toads disperse from their breeding sites and breeding for Cascades frogs, which can extend into August (WDFW 2022b; Lofgren and Anderson 2020). This overlap could result in injury or mortality of western toads and Cascades frogs, and adverse impacts on some individual animals are likely. Following construction, the longer span of the bridge would allow for a natural migration of Fryingpan Creek, which would benefit western toads and Cascades frogs in the long term, as it would create a more natural and diverse habitat within the streambed.

**Northern Spotted Owl.** Although no northern spotted owls have been detected at the project site in recent years, the occasional dispersing of an individual owl or owls from nearby territories could move into these areas and use the existing mature forest for a portion of a season. Therefore, alternative B could adversely affect northern spotted owls through loss of potential habitat and disturbance from blasting and construction noise.

The permanent habitat loss under alternative B would be approximately 0.6 acre of coniferous forest, steep shrubland, and roadside edge habitat. However, a total of 1.7 acres of coniferous forest would be cleared under alternative B and it is expected that restoration of this habitat would take decades. For this analysis, the entire 1.7 acres of coniferous forest are considered habitat loss, given the time needed to restore this habitat. This includes approximately 80 trees with a DBH of 18 inches or greater. Six of these trees are very large trees of conservation concern that provide large limbs or cavities that could provide nesting habitat for spotted owls. As noted in the “Soils and Vegetation” section, alternative B would require the removal of up to 30% of the estimated 3,000 trees in the project area, which would equate to a reduction of potential habitat for the spotted owl in this section of the park. As the design for this project progresses, the design team would explore options to avoid or minimize the removal of large mature trees. Tree removal would occur outside of the spotted owl nesting season, or following a nesting bird survey to ensure that there are no nesting spotted owls in or near the project area. If spotted owls are detected during these surveys, the NPS would stop work and re-initiate consultation with the USFWS to determine if additional conservation measures are necessary.

Increased noise and human presence from construction activities under alternative B could result in disturbance to individual owls. Noise and activity from construction during the breeding season have the potential to affect the normal breeding and roosting behaviors of spotted owls. The loudest proposed activities include the use of jackhammers, pile driving, and blasting. Other construction activities would raise noise levels from the typical baseline levels but would not be expected to significantly extend out from the project area.

Blasting could affect owls foraging or roosting within or near the project area. Early spotted owl nesting occurs from March 15 to July 31, and late nesting extends from August 1 through September 30. Blasting would likely be scheduled between June 15 and August 15 (pending Section 7 ESA consultation) due to concerns for bull trout. Blasting during nesting season could result in potential disturbance to spotted owls if they are actively incubating eggs or brooding hatchlings at nearby sites. Blasting could also affect owls foraging or roosting within or near the project area. Spotted owl responses to noise disturbance range from no apparent reaction to an alert response where the owls are attentive for the duration of the activity, to a flush response (Delaney et al. 1999). A negative effect on breeding occurs when noise or project activity causes a spotted owl to become so agitated that it flushes away from an active nest site or aborts a feeding attempt during the incubation or brooding of nestlings. Such events are considered important because they have the potential to result in reduced hatching success, fitness, or survival of juveniles. Ongoing spotted owl monitoring would provide early evidence of any active use by spotted owls at the project site, and construction would be limited to daylight hours to avoid times when the owls are most active; therefore, reducing the potential for noise disturbance from construction.

Considering the current absence of the spotted owl in the project area and the availability of extensive suitable habitat available adjacent to the project area, alternative B *may affect but is not likely to adversely affect* northern spotted owls.

**Marbled Murrelet.** Although marbled murrelets have not been confirmed in the project area, individual murrelets that use the surrounding area could potentially be affected by alternative B, specifically from the loss of suitable nesting habitat, as well as potential impacts due to project-related noise. Habitat loss for marbled murrelets would be the same as described for northern spotted owls above — alternative B would result in the removal of approximately 1.7 acres of coniferous forest, including large mature trees that provide branch structures that may be suitable for use as nesting platforms. Although alternative B would effectively result in a permanent loss of 1.7 acres of mature forest habitat, the project area is immediately adjacent to a primary road corridor that currently experiences relatively high levels of human and vehicular disturbance, making this habitat less suitable for murrelets.

There is limited information concerning murrelet vulnerability to disturbance effects. Disturbance occurs when noise or project activity causes a murrelet to become so agitated that it flushes away from an active nest site or aborts a feeding attempt during the incubation or brooding of nestlings. Such events have the potential to result in reduced hatching success, fitness, or survival of juveniles. In general, observed responses to noise disturbance at nest sites have been modifications of posture and on-nest behaviors without flushing or abandoning the nest (NPS 2021b). Noises from construction activities could result in behavioral changes to murrelets as they incubate on a nest but would not necessarily cause a flight response or failed nesting attempts (NPS 2021b). However, some reports indicate that abrupt noises, such as a car door slamming, can result in a disturbance response, but appear to be related to previous exposure (Long and Ralph 1998). Overall, it appears that murrelets are not easily disrupted from nesting attempts by human disturbance except when confronted at or very near the nest itself (NPS 2021b). Blasting and other construction activities would occur during marbled murrelet nesting season (April 1 to September 22). These activities could affect murrelet chicks in nests in trees adjacent to the project area and could also result in other adverse impacts, such as flight responses in nesting adults or nest abandonment.

Considering the lack of evidence of murrelet activity within or near the project area, the location of the habitat removal along a primary road corridor, and the extensive amount of suitable habitat available within the park, alternative B *may affect but is not likely to adversely affect* marbled murrelets.

**Gray Wolf.** Alternative B would result in a relatively small amount of vegetation removal (2.3 acres with 0.6 acres of permanent vegetation loss) from the park, as described under the “Soils and Vegetation” section. This amount of vegetation removal would not meaningfully degrade potential gray wolf habitat in the park. However, the removal of large, mature trees, as well as many smaller trees could discourage elk and other prey species of the wolf from using the project area during construction and could change how these species use the area until forest communities develop the same level of old-growth characteristics as current conditions. The proposed replacement of the existing bridge with a longer bridge would provide for a wider area beneath the bridge that may facilitate wildlife travel through the area by providing an improved wildlife crossing opportunity separate from Sunrise Road in this location. During construction, the increased noise would likely deter dispersing wolves from using the habitat in or near the project area or disturb gray wolves during denning and rendezvous activities. However, construction would be temporary, and wolves may move back into the area following construction. Because wolves have not been documented within the project area and extensive suitable habitat adjacent to the project area and throughout the park would continue to be available to wolves and their prey should they be present within the park during project activities, alternative B *may affect but is not likely to adversely affect* gray wolves.

**North American Wolverine.** Alternative B would require the removal of a relatively small amount of vegetation along an existing road corridor. This amount of vegetation removal would not represent a meaningful impact on wolverine habitat in the park because extensive suitable habitat that would continue to be available adjacent to the project area and throughout the park. The increased noise during construction seasons would likely deter wolverines from using the habitat in or near the project area; however, construction would be temporary, lasting only during the daylight hours of the construction seasons, and wolverines may then move into the area following construction. Because wolverines typically remain in high-elevation habitats and construction would have minimal long-term impacts on the habitat in the park available to wolverines, alternative B *will not jeopardize the continued existence* of North American wolverines.

### *Impacts of Alternative C*

Alternative C would result in the same types of impacts on special status species as described for alternative B, but the amount of vegetation removed and the sequence of construction events would differ. Approximately 1.8 acres of mature coniferous forest, steep shrubland, and roadside edge habitat would be cleared as described in the "Soils and Vegetation" section. Clearing would include the removal of approximately 60 trees having a dbh of 18 inches or greater. Among these are at least two trees of conservation concern that would be removed for construction of the temporary bridge and roadway — one silver fir and one Douglas-fir that are within the proposed road alignment. Another silver fir is at the very edge of the clearing limits and may also have to be removed. Although all disturbed areas would be revegetated following construction under this alternative, restoration of the existing natural conditions would take decades to establish mature vegetation and the restored areas would not replicate the habitat lost. Because of this, the entire 1.2 acres of mature coniferous forest cleared for alternative C would be considered a permanent loss.

Because alternative C would require a temporary bridge that would be constructed to safely accommodate all traffic, the dewatered work zones needed for this alternative would be double that required for alternative B — construction of the temporary bridge, demolition of the existing bridge, construction of the new bridge on the old alignment, and demolition of the temporary bridge. The duration of impacts under alternative C would be longer than that for alternative B and there would be further impacts from the additional in-water work. Alternative C may require blasting (pending the results of the geotechnical investigations) but likely fewer blasts than needed for alternative B since the area southwest of the existing bridge would not be cleared for an expanded parking area.

**Bull Trout.** Alternative C would have similar impacts on bull trout as those described under alternative B — potential adverse impacts on water quality and bull trout habitat during construction, as well as stress and injury from handling prior to dewatering of isolation work zones and during blasting activities. Because a temporary bridge would need to be constructed to allow for continued visitor access during the construction of the new bridge on the existing alignment, impacts would be consistent with those described for alternative B. However, alternative C would require more in-water work than alternative B due to the need for construction and demolition activities for two bridges. This would result in greater potential for harm to bull trout and its habitat. Although alternative C would install a new bridge with a longer span, the abutments would not be able to be located completely outside of the floodplain due to limitations in the topography. The restriction of the natural migrations of Fryingpan Creek channels would be reduced when compared to current conditions, but alternative C would still slightly constrict the creek. Due to the amount of in-water work and the potential for impacts, alternative C *may affect and is likely to adversely affect* bull trout. Removing the bridge abutments from the current active channel bed would be beneficial for bull trout, but due to the extensive instream work and the potential for turbidity, alternative C *may affect and is likely to adversely affect* designated bull trout critical habitat.

**Puget Sound Steelhead and Puget Sound Chinook Salmon.** Although steelhead and Chinook salmon have not been documented in the vicinity of Fryingpan Creek, their presence may be possible. As such, direct effects on steelhead and Chinook salmon that may be near the project and their habitat would be the same as those described for bull trout. Alternative C *may affect and is likely to adversely affect* Puget Sound steelhead and Puget Sound Chinook salmon. Due to the distance from the project area to the critical habitat of steelhead and Chinook salmon (11.3 and 9.6 miles downstream of the Fryingpan Creek Bridge, respectively), alternative C *may affect but is not likely to adversely affect* designated Puget Sound steelhead and Puget Sound Chinook salmon critical habitat.

**Essential Fish Habitat.** The impacts on designated EFH in the project area under alternative C would be similar to those described for alternative B — potential adverse impacts on water quality during construction and beneficial effects on habitat during the operation of the new bridge with a longer span. Although the bridge abutments would not be located completely outside the floodplain, the span would be outside of the current active channel, allowing for greater natural movement of the creek resulting in a long-term benefit on EFH compared to current conditions. The abutments being within the floodplain would still have an adverse impact on the natural conditions of the streambed, but it would be minimal. Although the overall impacts on EFH would be limited in scope and duration, Alternative C would have an adverse effect on EFH for Chinook, coho, and pink salmon.

**Amphibians.** Alternative C would have similar impacts on amphibians as described for alternative B, including adverse impacts on the western toad and Cascades frog from in-water work and blasting. The buffers of wetland D and stream D would have temporary and permanent impacts from vegetation clearing and replacement of the culvert. Since a new parking area would not be created under alternative C, the roadside ditch would remain in its current state. Alternative C would remove the bridge abutments from the current active channel, but there would be minimal restriction of the migration of Fryingpan Creek channels. The culvert would be replaced to better convey water across Sunrise Road, thus improving the hydrology for stream D and wetland D, potentially benefitting the Cascades frog, coastal tailed frog, and coastal giant salamander. Although there would be adverse impacts from habitat clearing, improved hydrology provided by the large culverts and widening the span of the bridge would result in long-term beneficial impacts on amphibians of conservation concern.

**Northern Spotted Owl.** Because owls have not been detected in the area for many years, alternative C would have similar impacts on northern spotted owl as those described under alternative B — loss of suitable habitat, including removal of some potential nesting trees, and potential disturbance from noise during construction, especially during blasting activities that would occur during the nesting period. Alternative C would result in less vegetation removal than alternative B due to a smaller clearing limit area and revegetation of the area used for the temporary bridge and road following construction, and there would not be any impacts from an expanded parking area. However, restoration of the disturbed areas would take decades or may never return to current conditions, effectively resulting in permanent habitat loss. Considering the lack of spotted owls in the project area and the availability of extensive suitable habitat available adjacent to the project area, Alternative C *may affect but is not likely to adversely affect* northern spotted owls.

**Marbled Murrelet.** Because marbled murrelets have not been detected in the area, alternative C would have similar impacts on murrelet as those described under alternative B — no impacts on mapped marbled murrelet nesting habitat and potential disturbance on nesting murrelets from construction-related noise, including blasting noise. Considering the lack of evidence of murrelet activity within or near the project area, the location of the habitat removal along a primary road corridor, and the extensive amount of suitable habitat available within the park, alternative C *may affect, not likely to adversely affect* marbled murrelets.

**Gray Wolf.** Alternative C would have similar impacts on gray wolf as those described under alternative B — minimal habitat removal along a previously developed corridor and short-term adverse impacts from noise during the construction phase of the project. Because wolves have not been documented within the project area and extensive suitable habitat adjacent to the project area and throughout the park would continue to be available to wolves and their prey should they be present within the park during project activities, alternative C *may affect but is not likely to adversely affect* gray wolves.

**North American Wolverine.** Alternative C would have similar impacts on wolverines as those described under alternative B — minimal habitat removal along a previously developed corridor and short-term adverse impacts from noise during the construction phase of the project. Because wolverines typically remain in high-elevation habitats and construction would have minimal long-term impacts on the habitat in the park available to wolverines, alternative C *will not jeopardize the continued existence* of wolverines.

### Cumulative Impacts on Special Status Species

As discussed in the "Affected Environment" section above, special status species are affected by a variety of sources, including climate change, habitat loss, competition from nonnative and other species, mortality from traffic, and effects of human-caused changes. Past, present, and future planned actions in the park that involve loss of habitat, increased development, the potential spread of nonnative species, and disturbance from increased noise and/or human presence (e.g., road and facility improvements, emergency road repairs, rehabilitation of infrastructure and visitor use areas, and ongoing park operations) also have had or could have adverse effects on special status species in the park. The park would continue to implement mitigation measures to reduce adverse impacts on special status species, but these projects could contribute long-term cumulative effects on the park's special status species. Alternative A would not contribute to the cumulative adverse effects on special status species, as the area has been developed for decades and there is no plan to further disturb it. However, if there is bridge failure, this would result in a substantial adverse contribution to adverse impacts on special status species. Alternatives B and C would contribute additional cumulative adverse effects, specifically from the loss of habitat, in-water work, and disturbance from blasting and other construction activities. With approximately 97% of the park designated as Wilderness, the park protects large amounts of habitat for special status species, but these species are at risk from a host of other threats, such as climate change and habitat loss. Removal of up to 1.7 or 1.2 acres of mature forest under alternatives B and C would represent a permanent loss, and construction, although short-term, could also adversely affect special status species. For some special status species, these impacts would be meaningful. Alternatives B and C would contribute to the cumulative impacts on special status species.

### *Conclusion for Special Status Species*

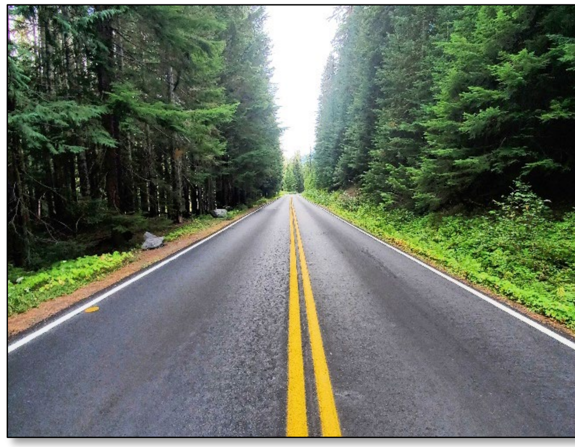
Alternative A would not result in any new impacts on bull trout, Puget Sound steelhead, Puget Sound Chinook salmon, EFH for pink, Chinook, and coho salmon, amphibians of conservation concern, northern spotted owl, marbled murrelet, gray wolf, or North American wolverine. Similarly, alternative A would not have new impacts on designated critical habitat for bull trout, Puget Sound steelhead, or Puget Sound Chinook salmon. However, if the bridge were to fail and collapse into Fryingpan Creek, alternative A would result in long-term adverse impacts on aquatic species, as there would be direct impacts to aquatic habitat (including bull trout spawning habitat), the potential loss of active redds or individual animals, and migration corridors would be blocked. Bridge failure would also have an adverse effect on EFH. Alternative A would not contribute to the impacts on these species from other ongoing and future projects unless the bridge fails, in which case, it would result in a substantial adverse contribution to adverse impacts on special status species. Alternatives B and C would require the removal of potential habitat to complete construction activities. Although the areas to be cleared would be relatively small compared to similar habitat available throughout the park (coniferous forest, steep shrubland, and roadside edge habitat), the loss of mature forest would be considered permanent for the purposes of this analysis due to the amount of time it would take to return to current conditions. The affected habitat is along a road corridor and the surrounding area would still provide high-quality habitat for all wildlife species. Special status species would be affected by construction-related noise, especially noise from blasting and construction-impact equipment, ranging from minor disturbance to mortality. Risk of injury and mortality would be limited to aquatic species that could be trampled by construction equipment while establishing dewatered work zones or affected by the concussive forces of blasting, if required. Gray wolves and wolverines would likely avoid the project area while construction activities were ongoing. Northern spotted owls and marbled murrelets could be disturbed during nesting or roosting. Bull trout would be adversely affected through in-water work, water quality impacts, and construction noise; steelhead and Chinook salmon could be affected in the same ways, although these species have not been documented within the project area. However, over the long term, these fish species would benefit from the operation of either of the new bridges due to the longer spans. Alternative C would not be able to completely remove the bridge abutments from the floodplain, but the wider span would reduce constriction of the creek. Alternative B would remove both abutments from the floodplain allowing the highest level of channel migration among the three alternatives. EFH for Chinook, coho, and pink salmon would be adversely affected by the extensive in-water work under both alternatives B and C. Alternatives B and C would contribute to the impacts on several special status species when including other ongoing and future projects in the park.

# Cultural Landscapes and Historic Structures

## Affected Environment

The regulations implementing Section 106 of the National Historic Preservation Act (36 CFR 800), define a historic property as “any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register of Historic Places (NRHP) maintained by the Secretary of the Interior.” The project area involves the Fryingpan Creek Bridge, a contributing resource of the Yakima Park Highway, which is a historic road within the Mount Rainier NHLD (which is listed on the National Register at the highest level of significance).

Sunrise Road is another name for the Yakima Park Highway, but this section uses Yakima Park Highway to remain consistent with the documentation for the Mount Rainier NHLD. Designated in 1997, the NHLD is nationally significant for its association with the events of early NPS master planning and the Civilian Conservation Corps and the design style of naturalistic landscape architecture continued by the NPS in the period between World Wars I and II. As part of the early Mount Rainier National Park Master Plan, the Yakima Park Highway is significant for its association with the national park system's most complete and significant example of park master planning. The road is also significant for its naturalistic landscape engineering as a scenic park highway.



*The narrow road corridor of the Yakima Park Highway within the project area*

Today, the Yakima Park Highway remains largely unchanged and is an intact example of an early national park scenic highway constructed using the first national NPS standards for road building. The road's naturalistic character is evident in its remaining landscape characteristics and features, namely in the road's spatial organization, land use, circulation patterns, structures, small-scale features, views and vistas, topography, its pattern of response to natural systems, and archeological sites. These patterns and their contributing features, such as stone bridge walls extending along the road leading from the bridge ends, the road's narrow curvilinear alignment, and vista turnouts, continue to exist as originally planned and, together, convey the integrity of the road as a scenic highway.

*Details of the native hewn stone walls of the Fryingpan Creek Bridge*

The major circulation patterns and associated features of the Yakima Park Highway have changed little since the period of significance, which is the time when a property was associated with important events, activities or persons, or attained the characteristics that qualify it as a historic property. Many of the historic turnouts are still intact, trailheads are easily accessible from the road, and sidewalks and curbs guide visitors safely along bridges and to viewpoints. Due to a build-up of glacial debris washing onto the roadway, which was later cleared to the roadsides, shoulder widening has occurred in numerous locations (NPS 2008).

*Native stone on Fryingpan Creek Bridge and its abutments*

The *National Park Service Cultural Landscapes Inventory Yakima Park Highway Mount Rainier National Park* (NPS 2008) contains detailed descriptions of the historic property and character-defining features. These features include the road alignment, bridges, retaining walls, guard rails, retaining walls rock barriers, entrance station, trailheads, views and vistas, turnouts, rock cuts, tree groupings and specimen trees, and culverts. NPS guidance defines a specimen as “within a cultural landscape, biotic cultural resources are recognized either as a system or as individual specimen features that contribute to the landscape’s significance” (NPS 1998).

The Fryingpan Creek Bridge is located at approximately milepost 4.2 on the Yakima Park Highway. The Fryingpan Creek Bridge is a three-hinged arch structure with solid web arch girders. The abutments and wing walls are faced with native hewn stone. The final arch spans over 127 feet, making it one of the longest in the park. Walls along the roadway extend from the ends of the bridge. The abutments incorporate oversized native stone.

In addition to the bridge, the other character-defining features associated with the historic district that are within or adjacent to the project area (between mileposts 4.0 to 4.5) include:

- Five culverts with associated headwalls
- Two framed vistas from a moving vehicle
- Four specimen trees (western hemlocks)
- Two tree groupings (Pacific silver fir)
- Four rock barriers

### *Environmental Trends*

Many of the park’s transportation infrastructure features are contributing resources to the NHLD. This infrastructure is aging, has required, and will continue to require maintenance, rehabilitation, or replacement (see appendix E for a list of current and proposed projects). Climate change is raising the temperature and influencing many climate conditions and events beyond their historical ranges. Washington State is already experiencing trends that are consistent with a warming climate, from warmer temperatures to rising sea levels to melting snow and ice to more drought and extreme rainfall (Washington Department of Ecology 2012).

## Impacts Assessment for Cultural Landscapes and Historic Structures

Adverse impacts would alter any of the characteristics of the historic district that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property’s location, design, setting, materials, workmanship, feeling, or association (36 CFR 800.5).

## Impacts of Alternative A

Under alternative A, the historic bridge would continue to be used. The bridge would continue to be inspected annually, and the park would continue to make limited repairs that would maintain the bridge. Over time, however, as the bridge continues to deteriorate, weight limits would likely be imposed for travel on the bridge. There would be no changes to the bridge and no changes to the historic road or the historic district that would diminish its integrity. Although alternative A would not have new impacts on the historic district within the project area, the bridge would continue to degrade. Over the long-term, the bridge could experience catastrophic failure due to failure of bridge components, flooding, and/or erosion resulting in an adverse effect on the historic property.

### *Impacts of Alternative B (Proposed Action/Preferred Alternative)*

Under alternative B, the historic bridge would be replaced. Construction equipment and materials would be staged within the boundaries of the NHLD, at the bridge and other staging areas, for two to three construction seasons. These effects would be adverse with the presence of non-historic elements within the district; however, these impacts would be temporary and reversible, and no longer present when construction is complete.

While it is preferable to preserve, repair, or restore (in that order) the characteristics of the bridge over reconstructing it, the current poor condition of the bridge requires its replacement. The rustic style of construction was characterized by hand-laid masonry on the bridge and walls. To reduce the effect of the changes from bridge replacement, the NPS would select a design and materials to construct the new bridge in a manner compatible with the historic characteristics of the NHLD, in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. The NPS proposes to remove, store, and reuse the existing stone masonry on the wing walls. Depending on the amount of available historic stone, at a minimum, this would be used on the top and interior wing walls (see figure 2), which are most visible to the public. If there is ample supply, the exterior lower sides of the wing walls would be veneered in historic stone as well, if enough stone is not available, the lower portion of the exterior wing walls would be form-lined concrete. The abutments would be form-lined concrete. The concrete form mold would be created from the existing stone facing. The proposed bridge rail appearance would also be consistent, to the extent practicable, with the railing on the historic bridge. The final design would be developed in coordination among the NPS, FHWA, and the State Historic Preservation Office (SHPO) to be compatible with the historic district.

At the five culverts, the existing stone would be salvaged and used to reestablish the headwalls when new larger culverts are installed. The culvert headwalls would be reconstructed in-kind with the existing headwall stone.

Replacing the bridge and culvert headwalls would alter the character-defining features of the Fryingpan Creek Bridge. In addition to the changes to the historic bridge and culverts, alternative B would result in other impacts on the NHLD. Under alternative B, approximately 930 feet of the existing curvilinear arrangement of the roadway would be realigned (340 feet on the east approach and 590 feet on the west approach). Additionally, a portion of the existing road would be used to create an expanded parking area, which would require the removal of three Pacific silver fir specimen trees identified in the cultural resources landscape report. The new parking area, walls, sidewalks, and toilet facilities would introduce contemporary structures and infrastructure into the historic setting. The final walls would also be finished to be compatible with the historic district.

*The current view upstream (southwest) from the Fryingpan Creek Bridge*

Changing the alignment would alter the views in the project area. Because the new bridge would be relocated, the framed vistas typically seen to the southwest (upstream) from a moving vehicle or from standing on the bridge would be widened due to vegetation removal. The view would also be altered by the addition of the parking area, additional vehicles, sidewalks, and toilet facilities. These changes would result in long-term, adverse effects on this historic view. Because no construction would occur downstream of the bridge, the views to the northeast (downstream) would not be expected to be noticeably altered.

*Rock barriers along the Yakima Park Highway within the project area (Google Earth)*

Four rock barriers, located along the road, would also need to be removed and stored during construction. After construction, these rocks would be relocated to areas where the park would want to discourage parking.

Clearing vegetation and new cut and fill along the roadway and around the parking area would be necessary for the proposed new bridge and parking area. Mitigation measures to reduce the effects of these actions are identified in appendix B. Over time, vegetation would grow back in the cleared areas, and the road, bridge, and parking area would soften (age) into the landscape.

The new bridge and realigned roadway would not be contributing features of the NHLD. In combination with the mitigations and design elements, the relocation and new bridge would be designed and constructed to be consistent with the overall characteristics of the road and NHLD and would not disqualify the roadway or other aspects of the NHLD for inclusion in the NRHP. Concurrence from the Washington SHPO on the assessment of effect is pending. As needed, other mitigation would be negotiated with the SHPO. Overall, alternative B would have short-term and long-term adverse impacts (an *adverse effect*) on the NHLD.

### *Impacts of Alternative C*

Staging, culvert replacement, compatibility with the NHLD, historic stone use, and altering the character-defining features of the Fryingpan Creek Bridge would be the same as alternative B and would have a similar adverse effect on the bridge and NHLD.

Unlike alternative B, the historic alignment, the framed vista, specimen trees, and rock barriers would be retained under alternative C. The bridge would be widened, which would slightly change the views while driving through the area. Two specimen tree groupings of Pacific silver firs, located on either side of the existing bridge would likely be impacted by the construction of the wider and longer bridge under this alternative, resulting in the loss of these historic features. This would have a minimal but long-term effect on the immediate setting around the bridge.

Although the temporary bridge and road needed to maintain visitor access to the Sunrise area would be removed after construction and the area would be revegetated with native species, it would take several decades for the area to regrow the mature forest that exists today.

The new bridge would not be a contributing feature of the NHLD. As in alternative B, the new bridge would be designed and constructed to be consistent with the overall characteristics of the road and NHLD and would not disqualify the roadway or other aspects of the NHLD for inclusion in the NRHP.

Concurrence from the Washington SHPO on the assessment of effect is pending. As needed, other mitigation would be negotiated with the SHPO. Overall, alternative C would have short-term and long-term, adverse impacts (an adverse effect) on the NHLD, although these effects would be less than alternative B.

### *Cumulative Impacts on Cultural Landscapes and Historic Structures*

Climate change is resulting in larger and more frequent storms. These storms increase flooding and debris flows and bring down more sediment from the quickly melting glaciers. Roads are increasingly susceptible to damage from flooding and erosion. The park closed for six months following a massive flood in November 2006 that washed out roads and damaged trails and campgrounds (Oliver 2019). In the future, flooding could impact more of the historic features of the Mount Rainier NHLD.

Ongoing actions that affect the historic districts are those that add new structures into or remove historic features from within the historic district boundaries. Most past, ongoing, and future projects generally involve preserving, repairing, and maintaining historic properties (see appendix E for a list of projects). The water and sewer line replacements that would be placed beneath previously paved and unpaved roads or disturbed corridors would not result in effects on the historic districts. Ongoing development projects, including the construction of new facilities and infrastructure within areas with historic developments, would result in additions and changes to the NHLD. These changes could vary from subtle and small, from the replacement of historic culverts and guard rails, to larger in scale, such as the loss of historic specimen trees, replacement of historic day-use facilities or other bridges, and changes in historic views. These changes and additions would result in adverse effects.

Under alternative A, the historic bridge, alignment, and contributing features within the project area would remain; therefore, this alternative would not contribute to cumulative impacts on cultural landscapes or historic structures when considered with past, ongoing, and future projects occurring near the project area. However, if the bridge catastrophically fails, this would contribute to the loss of historic features of the NHLD. Alternatives B and C would replace historic features with non-historic structures and elements. The impacts of these alternatives would be adverse and would contribute an adverse impact. Alternative C would replace fewer historic features than alternative B, resulting in a slightly less contribution to cumulative impacts. Under both alternatives, however, the overall character of the district would remain intact, and the NHLD would not be disqualified for inclusion in the NRHP.

### *Conclusion for Cultural Landscapes and Historic Structures*

Alternative A would not result in new impacts on the Mount Rainier NHLD or the Yakima Park Highway due to the construction of a new bridge, nor would it contribute to cumulative impacts on the historic districts. Over time though, on-going maintenance could result in minor degradation of the historic resource, and catastrophic weather events could result in large-scale degradation. Alternative B would result in adverse impacts on the historic bridge, alignment, and other features of the Mount Rainier NHLD, and the Yakima Park Highway. Although the new bridge would be compatible, it would no longer be contributing. This historic element would be removed; however, the changes would not alter the overall characteristics to the extent that the NHLD would no longer qualify for inclusion in the NRHP. Alternative C would result in adverse impacts on the Yakima Park Highway and the Mount Rainier NHLD. This historic resource would be rehabilitated and result in fewer adverse effects on the historic property than alternative B. The new bridge under alternatives B and C, and the new alignment under alternative B would not be contributing features of the NHLD. The adverse effects would not alter the overall characteristics to the extent that the NHLD would no longer qualify for inclusion in the NRHP.

Alternatives B and C would contribute to cumulative impacts on the historic district; however, the contribution would not be substantial. Concurrence from the Washington SHPO on the assessment of effect is pending.

# Visitor Use and Experience

## Affected Environment

Sunrise Road is a 15-mile section of highway that provides the sole vehicular access from Mather Memorial Parkway (Highway 410) to numerous trailheads, the White River Campground, and the Sunrise area. Vehicles are counted near the east end of the road at the White River Entrance station. Table 5 provides the daily totals for May through October of the past 5 years. Bicyclists also use Sunrise Road and share the traffic lanes with vehicles. The number of bicyclists that use the road is not counted.

**Table 5. Daily Vehicle Totals for Sunrise Road**

| Year | May | June | July | August | September | October |
|---|---|---|---|---|---|---|
| 2022[a] | 555 | 6,562 | 35,059 | 39,197 | — | — |
| 2021 | 2,000 | 10,399 | 44,194 | 34,500 | 24,134 | 7,686 |
| 2020[b] | 0 | 0 | 30,000 | 40,000 | 0 | 0 |
| 2019 | 3,600 | 13,700 | 61,000 | 59,000 | 16,358 | 1,935 |
| 2018 | 4,500 | 13,700 | 61,000 | 59,370 | 19,500 | 12,200 |
| 2017 | 4,538 | 13,591 | 59,370 | 50,000 | 20,000 | 10,000 |
| Average per month | 3,660[c] | 12,848[c] | 51,113 | 48,574 | 19,998[c] | 7,955[c] |

Source: NPS 2022e
— These numbers were not available at the time this document was written.
a – 2022 vehicle numbers are not complete, provided for informational purposes only, and are not included in the monthly averages.
b – The average daily traffic in 2020 is not comparable to the other years. Much of the area was closed due to the COVID-19 pandemic.
c – These are four-year averages due to zero counts.

Sunrise Road provides access to the Summerland Trailhead located at the Fryingpan Creek Bridge. The Summerland Trail is a spur trail that connects to the Wonderland Trail, a 93-mile-long trail that encircles Mount Rainier. Trail use is captured by a trail counter placed near the Summerland Trailhead. The daily average number of hikers (in both directions) from July through September was approximately 155 in 2015 and 131 in 2016. On a peak busy day with over 570 visitors recorded on the trail counter (in both directions), a hiker may encounter more than 73 people per hour on average. Table 6 provides the average daily traffic on Summerland Trail between 2017 and 2021 for the hiking season.

**Table 6. Average Daily Traffic on Summerland Trail***

| Year | May | June | July | August | September | October | Average Daily Traffic | Data Days |
|---|---|---|---|---|---|---|---|---|
| 2021 | 2,331 | 2,336 | 6,456 | 6,248 | 3,761 | 3,272 | 147 | 140 |
| 2019 | — | 2,194 | 4,603 | 5,207 | 2,455 | 1,253 | 120 | 101 |
| 2018 | — | 2,026 | 4,462 | 4,123 | 3,211 | 1,442 | 111 | 121 |
| 2017 | — | 2,569 | 5,135 | 4,632 | 1,719 | — | 128 | 93 |

NPS 2022f
— No data for this month
*The average daily traffic in 2020 is not comparable to the other years, and therefore not included in this table. The counter could not be maintained, resulting in June being the only month with complete data. Further, much of the area was closed due to the COVID-19 pandemic.

About 97% of the park's 236,381 acres are designated as wilderness (NPS 2015). Some visitors want to experience wilderness without the sights and sounds of modern development. The Wilderness Management Plan (NPS 1992) establishes three wilderness zones: trail, cross-country, and alpine zones. The plan describes the types of structures allowed in wilderness, standards for resource and social conditions, and standards for administrative use and management. The Summerland Trail is within the Wilderness Trail Zone, which includes durable and well-maintained trails that provide easy access to wilderness by large numbers of visitors at any one time with impacts concentrated along the trails and camping permitted at designated campsites. During the peak season, this zone would likely provide only limited opportunities for experiencing solitude.

*Formal pull-in parking spaces located west of the Fryingpan Creek Bridge*

Parking at the Summerland Trailhead, as shown in the photographs to the right, consists of formal pull-in parking spaces that can accommodate up to 15 vehicles on the northeast side of the road. Informal parking on the south road shoulder can accommodate up to 10 additional vehicles. Increased use of the Summerland Trail as a connection to the Wonderland Trail regularly causes the parking area to overflow onto the shoulders of the road before and after the bridge, and on both sides of the road. Visitors exiting the parking spaces must back into traffic. Visitors who access the trailhead must cross the road because the trailhead is on the southwest side of the road. There are no toilet facilities at this parking area/trailhead, so visitors either stop at other locations with facilities or natural areas near the trail.

*Cars parked on the shoulder of Sunrise Road near the Fryingpan Creek Bridge*

Some visitors take in the views from their moving vehicles, while other visitors make a short stop at the Fryingpan Creek Bridge area. They walk onto the bridge to look up and down the river. There are no sidewalks or separation between visitors and vehicles on the bridge. The view of the river from the bridge is also partially obscured by vegetation.

Another destination for visitors is the White River campground and amphitheater. The campground is generally open from the last week of June through the latter part of September. In 2021, there were 12,660 overnight tent stays at the White River campground. This was up from 2020 when there were only 7,862 overnight tent stays due to campground closures caused by the presence of hazard trees. This represents about 21% of the park's tent overnight stays. There were also 3,812 recreational vehicle (RV) overnight stays in 2021, and 2,078 in 2020 (about 15% of total RV overnight stays in the park) (NPS 2022g). In 2022, the park did not open the campground until July 1 due to snow in the campsites. In July 2022, there has been a total of 1,806 overnight stays with 1,369 tent stays and 437 RV stays. In August, there were 2,476 overnight stays with 1,895 tent stays and 581 RV stays (NPS 2022g). The park also provides interpretive presentations at the amphitheater.

The Sunrise area includes the Sunrise Visitor Center, which provides exhibits, information, interpretive programs, Junior Ranger activities, and a sales area operated by the park's cooperative association, Discover Your Northwest. Park rangers at this station provide emergency assistance and the building offers refuge during inclement weather. As the hub for visitor services in the area, the visitor center houses the Meadow Rover volunteer program, whose staff oversee thousands of hours of volunteer Preventative Search and Rescue support, meadow resources protection, and emergency response during summer and fall. The Sunrise Day Lodge, open from early July to late September, offers food service and a gift shop. Commercial services offered to visitors include summit climbs, guided day hikes, photography and art courses, and bicycle tours. The Sunrise area provides views of the Mount Rainier summit and an extensive network of hiking trails. The average Sunrise visitor stays about two and a half hours (NPS 2022f).

### *Environmental Trends*

Visitation to Mount Rainier National Park has continued to increase annually. This trend is expected to continue with associated increased visitation demand for the areas accessed by Sunrise Road. As the climate warms, the line marking the upper limit of the summer's snowmelt has moved higher up the mountain. It is approximately 1,000 to 1,500 feet higher now than in the early 2000s. The retreating glaciers have more crevasses (cracks) for climbers and hikers to navigate. Melting permafrost results in the rock becoming looser or more unstable, causing more challenging hiking and climbing paths, as well as increased incidents of rock fall. As increased flooding and debris flows from larger, more frequent storms higher amounts of sediment are brought down from the quickly melting glaciers, making roads increasingly susceptible to damage from flooding and erosion. The park closed for six months following a massive flood in November 2006 that washed out roads and damaged trails and campgrounds (Oliver 2019). However, earlier snowmelt could result in peak visitation beginning earlier in the season and lasting longer into the shoulder seasons (later spring and early fall). For example, in 2015, the snow melt was about two months earlier than normal (Urton 2020).

## Impacts Assessment for Visitor Use and Experience

As described in the previous section, resource-specific context for assessing the impacts of alternatives on visitor use and experience is based on the fundamental resources and values of the park, which include high-quality recreational experiences ranging from camping, hiking, skiing/snowshoeing, wildflower viewing, stargazing, and mountaineering, to scenic driving, and overnight accommodations (NPS 2015).

### *Impacts of Alternative A*

Under alternative A, there would be no changes in existing visitor access to parking and the Summerland Trailhead at the bridge or facilities, and recreational opportunities above the bridge at the White River campground and Sunrise area. Visitor experience would continue to be degraded by the presence of human waste and toilet paper along the Summerland Trail. The sounds along the road and trails would continue to be dominated by the flowing creek water. Visitors would continue to enjoy the views either in their moving vehicle as they pass over the bridge or from a stationary position on the bridge. Visitors that wish to take in the views from the bridge would continue to walk on the bridge in the traffic lanes, and bicyclists would also continue to share the traffic lanes with vehicles, which would continue to expose visitors and bicyclists to safety concerns. Due to the narrow width of the existing bridge, applicable accessibility requirements would not be able to be met. Additional parking and restroom facilities would not be provided, resulting in visitors needing to stop at other facilities prior to stopping at this location. Parking at the Summerland Trailhead would continue to be limited and without designated accessible parking spaces or routes, and informal parking along the roadway would continue. Visitor safety would continue to be a concern, as visitors would continue to back into traffic to exit the parking area and cross the road to access the trailhead.

As the bridge continues to age, weight restriction may be necessary resulting in restricting certain vehicles from accessing areas above the bridge. Long-term impacts could result if some visitors are not able to access the areas due to weight restrictions on vehicles. Future load restrictions would also limit the park’s ability to conduct snow removal, which would ultimately shorten the season when the road is passable and open for visitor travel. Complete loss of vehicular access could result if degradation of the bridge continues, and the bridge no longer meets the requirements for continued vehicular use. The campground and Sunrise area would be closed, and all visitors to the area would be affected by catastrophic bridge failure.

### *Impacts of Alternative B (Proposed Action/Preferred Alternative)*

Under alternative B, while the project is being implemented, the Summerland Trailhead and parking area would be closed for safety reasons, and visitors would not have access to these areas. This would result in visitors accessing trails at other locations, creating congestion at these locations, which may temporarily degrade the visitor experience. Parking at these other trailheads would also become more crowded, preventing some visitors from being able to stop at these areas. The increase in encounters on the trails or the missed opportunity to hike these trails would result in an adverse effect on visitors.

During the two to three construction seasons, visitors would continue to have access to the White River Campground, other trailheads, and the Sunrise area; however, they may experience short (up to 30-minute) delays or longer closures (up to one hour two times a day) that would allow for construction crews to set bridge girders or perform blasting. The park may open the road a few days or weeks later in the spring or close the road earlier in the fall to accommodate construction if these short-term closures would allow the construction schedule to be completed within the planned two to three construction seasons. Late or early season closures may result in some visitors not being able to access the area.

Visitors planning to participate in concession-led tours may need to plan more time into the drive to the Sunrise area. To minimize the adverse effect on visitors, the park would post the schedule, delays, closures, and/or other information on its website and other social media sites so visitors may plan accordingly or choose to avoid the area altogether.

Staging equipment and materials would be visible during construction. Although this is common for construction sites, it would create an additional adverse effect on visitor experience, detracting from the natural scenery.

As described previously, the average maximum noise levels at 50 feet from heavy equipment range from about 73 to 101 dBA for non-impact equipment (e.g., excavator, dump truck), and 79 to 110 dBA for impact equipment (e.g., pile drivers, jackhammers, and rock drills). Blasting operations can reach 126 dBA. Dense vegetation can reduce noise levels by as much as 5 dB for every 100 feet of vegetation (NRC 2012). For comparison, light auto traffic at 100 feet is about 50 dBA and a running creek is about 40 dBA at 100 feet. Topography change can also reduce noise levels, and environmental factors, such as wind and water, can mask some of the construction noise (NRC 2012). During construction, hikers in the wilderness area may hear the construction noise up to 0.25 mile from the construction site depending on the wind direction and amount of creek flow. Short-term impacts on the visitor experience would be adverse. However, in areas located further away from the construction site and adjacent to creeks or rivers, the soundscape would still be dominated by the flowing water.

After construction, visitors who appreciate the historic resources of the park would no longer be able to enjoy this particular historic feature. The historic view would be altered by tree removal, which would open up a wider viewing angle and introduce modern developments intro the viewshed. This would result in a long-term adverse impact for those visitors. However, long-term, these visitors would still have access to other historic features west of the bridge. The new bridge would also have a raised ABA-compliant sidewalk to separate pedestrians from vehicles, adding safety and comfort to those that want to see the views from the bridge or cross the bridge. The new sidewalk would provide for separation between pedestrians (on the sidewalk) and bicyclists and vehicles (on the shoulder and the road, respectively). The design would allow bicyclists to use the shoulder instead of the traffic lane. This would result in greater safety and comfort for all users. Visitors would continue to enjoy the views from their moving vehicles as they pass over the bridge. Areas cleared and restored after construction would be most visible in the short-term and soften over the long-term as vegetation is reestablished. Visitors would continue to enjoy the same level of access, recreational activities, and ability to experience the natural and scenic qualities of the national park as they do now.

In addition, after construction, visitors would benefit from a new parking area with potentially up to 25 additional formal spaces (pending final design). Visitors would no longer back into traffic to exit the parking area or need to cross the road to access the Summerland Trailhead, resulting in greater visitor safety. Designated accessible parking spaces and accessible sidewalks would benefit visitors with mobility constraints. The increase in parking spaces in the lot, plus the availability of additional parking spaces along the road shoulder, would not exceed the visitor encounter rate on the Summerland Trail or exceed the desired condition or expectation for solitude at this section of the trailhead. The park would also implement measures to discourage parking outside of designated areas. The new signs and toilets would provide additional convenience for visitors. This would also likely reduce the amount of human waste and toilet paper that visitors experience along the Summerland Trail. The new bridge would span the current creek and floodplain, providing a long-term, safe transportation corridor to the Summerland Trailhead, White River campground, and Sunrise area. These changes would result in long-term beneficial effects on visitor experience.

Short-term impacts on all visitors to the area would be adverse and temporary. There would be a specific group of visitors that would experience long-term adverse impacts from the loss of the historic features, however, all visitors would benefit from the long-term effects of the improved bridge and parking area. There would be minimal long-term adverse effects in the landscape of the immediate area.

### *Impacts of Alternative C*

During construction, the impacts on visitors would be similar to those as described under alternative B, including trailhead and parking area closures, crowding, short-term road closures and delays, visual intrusions, and noise.

After construction, the new bridge would also have a raised ABA-compliant sidewalk to separate pedestrians from vehicles and bicyclists, and bicyclists would also have more separation from vehicles on the bridge due to the addition of the sidewalk (removing pedestrians from the traffic lane and allowing bicyclists use of the shoulder), adding safety and comfort, similar to alternative B. After construction, visitors who appreciate the historic resources of the park would no longer be able to enjoy this particular historic bridge and culverts, but other features would be intact. This would result in a long-term adverse impact for those visitors. However, visitors would continue to enjoy the historic views from their moving vehicles as they pass over the bridge, and similar to alternative B, long-term, these visitors would still have access to other historic features west of the bridge.

After construction, the parking area would remain in its current configuration, although a few parking spaces would be lost (up to 6 parking spaces) due to the increased length of the bridge, which may limit visitor access to this trailhead at busy times. Toilet facilities would not be added so hikers would continue to experience human waste and toilet paper along the Summerland Trail. Visitors would continue to experience the natural and scenic qualities of the park as they do now. Although the area of cleared vegetation would be restored after construction, the area to be restored would be much larger under alternative C than alternative B, due to the construction of the temporary road and bridge. This area would be more visible and have a longer adverse impact on visitor experience, although all of the cleared areas would eventually be restored. The greatest impact would occur shortly after construction is complete and diminish over time as the disturbed areas are revegetated and restored.

The new bridge would provide a longer-term and safer transportation corridor than the current bridge; however, the bridge would still be partially in the floodplain and subject to flooding and could be damaged from floods and erosion.

As with alternative B, short-term impacts on all visitors to the area would be adverse and temporary. There would be a specific group of visitors that would experience long-term adverse impacts from the loss of the historic bridge, however, all visitors would benefit from the long-term effects. Long-term effects would be both adverse and beneficial.

### *Cumulative Impacts on Visitor Use and Experience*

Under alternative A, the bridge and parking area would remain unchanged; therefore, this alternative would not contribute to cumulative impacts when considered with the ongoing and future projects occurring near the project area. However, if there is bridge failure, this would result in a substantial adverse contribution to visitor use and experience due to closure of the campground and Sunrise area.

Past, present, and future actions that would impact visitor use and experience include facility and infrastructure construction and maintenance that may close certain areas or facilities, and other road or infrastructure projects that did or could result in short- or long-term traffic closures. These actions would result in adverse impacts on visitors, including changes to plans or activities. Projects involving tree removal, blasting, and noise would also result in an adverse impact on visitors' experiences within the park. Alternatives B and C would contribute temporary adverse effects during construction and long-term beneficial effects on visitor use and experience from the construction of a new bridge. Alternatives B and

C would also contribute long-term adverse effects from loss of this and other historic structures as they deteriorate, depending on mitigation, and the loss of interpretation opportunities of these historic resources. Alternative B would contribute an additional long-term beneficial effect due to the expanded parking area and toilet facilities. However, the incremental changes of these action alternatives would not make a substantial contribution to the overall visitor experience and use effects from other ongoing and future projects.

### *Conclusion for Visitor Use and Experience*

Alternative A would result in adverse long-term impacts on some or all visitors due to eventual weight restrictions or potential bridge failure. However, visitors would continue to enjoy the same level of access, recreational activities, and ability to experience the natural and scenic qualities of the park as they do now until vehicular access is restricted or lost. Alternative A would not contribute to the cumulative impacts on visitor use and experience, unless weight restrictions are imposed or the bridge fails, then the contribution would be adverse and substantial.

Alternatives B and C would result in short-term, adverse impacts on visitor use and experience during construction. Long-term effects would be primarily beneficial, providing a safe and consistent transportation corridor for vehicles, bicyclists, and pedestrians/hikers. Under alternative B, new toilet facilities would also provide benefits to the visitors. However, increased use at the Summerland Trailhead could result in long-term adverse effects under alternative B. Alternative C would decrease parking and would not provide toilet facilities, therefore this alternative would also have some adverse impacts on visitors that would not result under alternative B. Alternative C would also have a larger area to be restored and have an adverse long-term effect on the views in the project area. Alternatives B and C would not make a substantial contribution to the overall visitor experience and use effects from other past, ongoing, and future projects.

# CHAPTER 4: CONSULTATION AND COORDINATION

## Public Involvement

The NPS notified the public of this proposed bridge project through a press release on March 9, 2022, that was distributed electronically and posted on the NPS Planning, Environment, and Public Comment (PEPC) website, as well as on social media. The press release provided a link to a web presentation (an ArcGIS StoryMap) that provided information about the project area and the preliminary options for management. The NPS also hosted a virtual public meeting in which park, FHWA, and contractor staff presented information on the project and the potential options and held a question-and-answer session. A 30-day comment period on the project was open through April 9, 2022. Comments and concerns were related to access to the Sunrise area, the cost and longevity of the project, the materials and methods that would be used for construction, potential impacts on natural and cultural resources, and safety issues. Commenters also suggested additional elements for inclusion in the proposed action. These comments were considered when developing the alternatives carried forward in this EA for full analysis.

## Agency Consultation

The park is consulting with the US Fish and Wildlife Service, National Oceanic and Atmospheric Administration – National Marine Fisheries Service, and State Historic Preservation Office pursuant to the Endangered Species Act, Magnuson-Stevens Fishery Conservation and Management Act, and National Historic Preservation Act, respectively. Consultation is ongoing.

## Tribal Consultation

An important part of the process is the inclusion of American Indian Tribes. The park consults with Tribes that have tribal lands within or adjacent to Mount Rainier National Park, and with Tribes that attach historic and cultural significance to resources within the park. The park has invited consultation from affiliated tribes for this project by sending letters to the tribes in December 2021 along with a map of the project area of potential effect and a copy of the fisheries report. Letters were also sent in January 2022 with a copy of the archeological survey report. The park also provided project updates and invited tribal consultation during the park's annual meeting with Tribes in April of 2021 and 2022. The park will continue to consult with the tribes throughout this process. The following affiliated tribes were contacted:

- Cowlitz Indian Tribe
- Muckleshoot Indian Tribal Council
- Nisqually Indian Tribe
- Puyallup Tribe of Indians
- Squaxin Island Tribe
- Yakama Nation

The Nisqually Indian Tribe responded on February 10, 2022 and asked to be kept informed if any human remains are located during construction. They defer to the Puyallup Tribe of Indians and the Muckleshoot Indian Tribe as to the impacts of the project on the creek. The Yakama Nation responded on February 1, 2022, that they had no concerns.

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# Appendix A: Resource Topics Dismissed as Stand-Alone Topics from Detailed Analysis

# ISSUES AND RESOURCE TOPICS DISMISSED AS STAND-ALONE TOPICS FROM DETAILED ANALYSIS

This appendix presents the issues and resource topics that were dismissed from detailed analysis based on the methods presented in chapter 1 and the rationale for dismissal.

## Air Quality

The action alternatives could have a slight effect on air quality from the use of construction vehicles, heavy equipment operation, and generation of fugitive dust during construction activities; however, the effects would be localized and temporary, lasting only for the duration of construction. Construction and demolition for this project would occur over two to three years during snow-free periods. Best management practices (BMPs) to control fugitive dust would be implemented, reducing potential impacts on air quality. BMPs would include but are not limited to, the following: wetting soils to suppress dust, maintaining the existing vegetation to the extent possible, limiting speed limits on unpaved roads, and limiting demolition work in high-wind conditions. This project would not lead to an increase in traffic; therefore, no long-term impacts on air quality are expected from vehicle emissions. For these reasons, air quality is dismissed from further analysis.

## Water Quality and Quantity

The action alternative could have a localized and temporary effect on water quality during construction from ground disturbance (erosion), discharge of construction fill material, runoff from contaminants, and spills from fuels and other liquids used during construction. BMPs for water quality are included in Appendix B: Resource Protection Measures. The NPS would work with the design team to determine if any additional mitigation and construction BMPs would be needed to reduce the potential for impacts on water resources. Further, turbidity control, water quality management, and implementation of BMPs during construction would be conducted in accordance with all federal and state permitting and regulatory requirements. Construction and operation of a new bridge under the action alternatives would not require the withdrawal of water from Fryingpan Creek. In-water work would require dewatering in work zones; however, water would be discharged to an upland location to allow infiltration, preventing turbid water from directly entering the creek. This process would allow the water to eventually flow back to Fryingpan Creek, so no water is permanently diverted from the creek. Thus, there would be no impacts on water quantity. Because impacts on water resources would be localized, temporary, and mitigated using BMPs and stipulations required by permits. Specific water quality issues for wetlands and special status species are addressed in the analysis of those resources. For these reasons, water quality as a stand-alone resource topic was dismissed from detailed analysis.

## Wildlife and Wildlife Habitat

Mount Rainier National Park (the park) supports a variety of wildlife including many mammals, birds, amphibians, reptiles, and invertebrates due to the variety of habitats present. The project area is already disturbed and fragmented by Sunrise Road. Permanent and temporary loss of habitat would be minimal (maximum of approximately 0.6 and 2.3 acres, respectively) under the action alternatives and would be very small relative to the total amount of wildlife habitat available in the park’s 236,381 acres. Project activities would result in temporary disturbances to wildlife due to human presence and noise generation from equipment that may displace some wildlife during the construction activities. Potential effects on wildlife from increased noise could include increased physiological stress, changed behavior (e.g., less time foraging and more time watching the surroundings), and changed movement patterns (e.g., displacement to nearby habitat). Fryingpan Creek and the adjacent floodplain function as a wildlife corridor for both aquatic and terrestrial species. Wildlife may continue to use the wildlife corridor that runs through the construction zone, especially when construction activities cease for the day. To reduce the short-term impacts on wildlife, BMPs would be implemented, such as limiting construction activities to daylight hours, maintaining a clean work site, and using properly maintained equipment to minimize noise impacts. BMPs and mitigation measures for wildlife are included in Appendix B: Resource Protection Measures.

If a bridge with a wider span is installed, some wildlife species would be able to move through this area under the bridge and thereby not have to cross the road and risk encounters with vehicles. A wider span would also reduce impacts from the bridge constriction on the floodplain. The long-term effects on wildlife would be beneficial for aquatic species and those species using the stream bed as a travel corridor. Although the action alternatives would result in a loss of habitat, the impacts would be relatively small (up to 2.3 acres cleared) and would occur in a previously disturbed/developed area. Additionally, the wider span of the bridge under the action alternatives would enhance the floodplain and associated habitat. Special status and aquatic species of wildlife are addressed in the special status species and wetlands impact assessments. For the reasons stated above, wildlife not addressed in those sections was dismissed from detailed analysis.

## Nonnative Species

Vegetation removal and soil disturbance could facilitate the spread of nonnative invasive plant species, ultimately altering vegetation communities. To minimize the risk of invasive species being introduced or spread, all construction vehicles would be washed and inspected prior to use in the project area. Topsoil would be stockpiled during clearing and grubbing and would be used for revegetation of disturbed areas following construction. Any other materials used during revegetation would be certified to be free from noxious weeds, invasive plants, and other deleterious materials by a federal, state, or local public agency to avoid the introduction of nonnative invasive plant species or inappropriate genetic stock of native plant species. Following revegetation, restored areas would be monitored and managed to prevent colonization by nonnative invasive species. Because the introduction of invasive species would be reduced through these BMPs and the spread of any newly established populations would be controlled through active management, nonnative species was dismissed from detailed analysis as a standalone topic. Nonnative species are, however, addressed under the "Soils and Vegetation" section.

## Special Status Species (Monarch Butterfly and Whitebark Pine)

The NPS obtained a preliminary report identifying Endangered Species Act (ESA) listed species and critical habitat expected to be in or near the project area. The list included the following 11 species: bull trout (*Salvelinus confluentus*), Chinook salmon (*Oncorhynchus tshawytscha*, Puget Sound evolutionarily significant unit), steelhead (*O. mykiss*, Puget Sound distinct population segment), northern spotted owl (*Strix occidentalis caurina*), marbled murrelet (*Brachyramphus marmoratus*), yellow-billed cuckoo (*Coccyzus americanus*), Mount Rainier white-tailed ptarmigan (*Lagopus leucura rainierensis*), gray wolf (*Canis lupus*), North American wolverine (*Gulo gulo luscus*), monarch butterfly (*Danaus plexippus*), and whitebark pine (*Pinus albicaulis*). All species except for the monarch butterfly, yellow-billed cuckoo, Mount Rainier white-tailed ptarmigan, and whitebark pine have been carried forward for full analysis in chapter 3 in the "Special Status Species" section. The following paragraphs provide information on the monarch butterfly, yellow-billed cuckoo, Mount Rainier white-tailed ptarmigan, and whitebark pine and identify the rationale for dismissing these four species from detailed analysis.

The yellow-billed cuckoo is federally threatened and listed as endangered by the state of Washington. In the western United States, yellow-billed cuckoos are strongly associated with large patches of low to mid-elevation riparian habitat characterized by high humidity (Gaines and Laymon 1984, USFWS 2014). Yellow-billed cuckoos nest in deciduous habitats with clearings and dense shrubby vegetation, especially those near rivers, streams, and wetlands (Wiles and Kalasz 2017). Habitat use during migration and winter can include habitats such as thick scrub, open woodlands, secondary forest, forest edge, and mangroves (Wiles and Kalasz 2017). Although cuckoos currently appear to be functionally extinct in Washington (WDFW 2022a), it is possible that very small numbers of breeding pairs may still occasionally occur in the state and are yet to be discovered due to a lack of surveys for the species. Based on the species' very rare historical record of occurrence in the state, the general lack of suitable nesting habitat within the project area, and lack of documented presence within the park, the NPS has determined that the project would have *no effect* on yellow-billed cuckoo.

Mount Rainier white-tailed ptarmigan is a candidate for listing as a federally threatened species. This subspecies of white-tailed ptarmigan is one of five in North America and found only in the Cascade Mountains of Washington State and British Columbia. The Mount Rainier white-tailed ptarmigan's breeding and non-breeding habitat is above the treeline in the alpine zone. This species is considered for listing due to habitat degradation caused by climate change (USFWS 2021). The Mount Rainier white-tailed ptarmigan is present in the park; however, the project area is below the alpine zone. For this reason, the NPS has determined that Mount Rainier white-tailed ptarmigan and its habitat are not present in the project area. As such, the project would have *no effect* on Mount Rainier white-tailed ptarmigan.

The monarch butterfly is a candidate species for listing under the ESA. Monarch butterflies are native to North and South America and can be found throughout the lower 48 states and in Hawaii (USFWS 2022). Populations in eastern and western North America will undergo a migration of up to 2,000 miles to reach an overwintering site (USFWS 2022). Most monarchs will overwinter in either California or Mexico and will gather together in a few locations (NPS 2017). Monarch butterflies are milkweed butterflies meaning that they obligately use milkweed (*Asclepias* spp.) host plants as an egg-laying substrate and subsequent larval food source (USFWS 2022). In Washington state, they are found east of the Cascades where milkweed occurs (WDFW 2022b). Based on NPS survey and monitoring data, the NPS has determined that the monarch butterfly and its habitat are not present in the project area. As such, the project would have *no effect* on the monarch butterfly.

Whitebark pine is listed as a federally threatened species. Whitebark pine is a slow-growing and long-lived tree that can tolerate poor soils, steep slopes, and harsh environments in alpine and subalpine locations. Cone crop production begins at 20 to 30 years of age; however, large crops are not produced until 60 to 80 years of age. Seed production varies between years, and high seed production occurs typically every three to five years. Whitebark pine grows in the highest elevation forest and at timberline. Its distribution is essentially split into two broad sections, one following the British Columbia Coast Ranges, the Cascade Range, and the Sierra Nevada, and the other covering the Rocky Mountains from Wyoming to Alberta. Whitebark pine typically grows at elevations above 5,000 feet in the park (NPS 2018); the project area is below this elevation at 3,800 to 3,900 feet. Based on NPS survey and monitoring data, the NPS has determined that whitebark pine and its habitat are not present in the project area. As such, the project would have *no effect* on whitebark pine.

## Archeological Resources

An archeological survey of the area of potential effect was conducted, and no archeological resources were discovered during the survey (NPS 2020). During construction, park staff would conduct archeological monitoring and adhere to an inadvertent discovery plan to prevent impact on archeological resources. Additional protection measures for archeological resources are included in Appendix B: Resource Protection Measures. Since no archeological resources have been found in the project area and additional protection measures would be put into place during construction, archeological resources was dismissed from detailed analysis.

## Lightscapes

Construction would only occur during daylight hours; therefore, there would be no changes to the existing lightscape during the construction period. No artificial lighting is proposed to be constructed on the bridge, parking area, or surrounding areas. Additional nighttime traffic would not increase due to the action alternatives. Therefore, lightscapes was dismissed from detailed analysis.

## Soundscapes

Human-caused sounds would increase during construction activities, including the use of heavy equipment, vehicular traffic, and construction crews. Sounds generated from construction would be temporary, lasting only during the construction activity. Sound levels from construction equipment that could be used for this project are listed in appendix D. Project-related construction noise would be minimized by using BMPs (see Appendix B: Resource Protection Measures), including limiting work to daylight hours in the project area to avoid night-time noise disruption and properly maintaining construction equipment to minimize noise. Effects from noise on visitors and special status species are discussed under those resource topics in chapter 3. Long-term, the project would not increase the amount of traffic on the road and, therefore, would not increase vehicular noise over current conditions. Shifting the alignment would not change the effects on any sensitive noise receptors. For these reasons, a detailed noise analysis is not necessary, and soundscapes was dismissed as a stand-alone resource topic from detailed analysis.

## Land Use

The replacement of the Fryingpan Creek Bridge would not change the land use in the area. After construction, the road, bridge, trailhead, and parking would still exist. Therefore, land use was dismissed from detailed analysis.

## Socioeconomics

Visitors to the park contributed $66,989,000 to the local gateway economies in 2021 as a regional recreation and national tourism destination (NPS 2022a). Approximately 80 companies provide a wide variety of commercial services in the park through concessions contracts or commercial use authorizations and include single-trip summit climbs, summer overnight trips (backpacking), drive-in campground use, guided day hikes, photography and art courses, winter day and overnight use, bicycle tours, and firewood sales at campgrounds. The Sunrise Day Lodge, open from early July to late September, offers food service and a gift shop (NPS 2022b). Sunrise Road offers access to the White River Campground and amphitheater, numerous pullouts and trailheads, and the Sunrise area. Construction activities could cause some temporary traffic delays and may result in some concessioners and gateway communities needing to accommodate these delays in scheduling activities. Several hour-long closures would be necessary for safety during blasting and installation of girders, and additional closures could be authorized as needed during construction. The proposed project would be designed to allow for continued visitor access during construction with minimal long closures. The park would keep the public and concessioners informed of delays and closures through various media. Because impacts on concessioners would be minimal and short-term and planned in advance, socioeconomics was dismissed from detailed analysis.

## Environmental Justice

The Fryingpan Creek Bridge is located within the park and not near population centers. The proposed alternatives would not disproportionately affect low-income or minority populations; therefore, this topic was dismissed from detailed analysis.

## Indian Trust Resources

No lands within the park boundaries are held in trust by the Secretary of the Interior for the benefit of Indians due to their status as Indians. Resources of tribal interest are addressed under special status species; therefore, this topic was dismissed from detailed analysis.

## Section 4(f) of the US Department of Transportation Act (23 CFR 138) and Section 6(f) of the Land and Water Conservation Fund Act

Section 4(f) of the US Department of Transportation (USDOT) Act, (23 CFR 138), which applies to all USDOT-owned, operated, or funded projects, protects significant publicly owned parks, recreation areas, and wildlife and waterfowl refuges, as well as significant historic sites, whether they are publicly or privately owned. However, a Section 4(f) evaluation is not necessary for any project involving a Federal lands transportation facility (codified in 23 US Code 203(c)), which includes all transportation facilities owned and maintained by the NPS. Therefore, the proposed project qualifies for the Federal Lands Transportation Facilities exception from further evaluation. Additionally, this project does not require analysis under Section 6(f) of the Land and Water Conservation Fund Act, as none of the public outdoor recreation facilities within the project area have used Land and Water Conservation Funds. Therefore, this topic was dismissed from detailed analysis.

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# Appendix B: Resource Protection Measures

## RESOURCE PROTECTION MEASURES

To minimize resource impacts related to the action alternatives, the project would implement mitigation measures and best management practices (BMPs) whenever feasible. These measures incorporate the regulatory requirements for the following:

- Antiquities Act (1906) and regulations at 43 CFR 3 (16 United States Code [USC] 431, 432, 433; Public Law 59-209)
- Archaeological Resources Protection Act of 1979, as amended, and regulations at 43 CFR 7 and 36 CFR 79
- Clean Air Act, 1970 (42 USC 7401 et seq.)
- Clean Water Act (33 USC 1251 et seq.)
- Endangered Species Act of 1973 (16 USC 1531 et seq.)
- Migratory Bird Treaty Act
- Magnuson–Stevens Fishery Conservation and Management Act
- National Historic Preservation Act (NHPA) of 1966, as amended (16 USC 470 et seq.) and regulations at 36 CFR 60, 63, 65, 78, 79, and 800 (16 USC et seq)
- NPS Organic Act of 1916 (16 U.S.C. l 2 3, and 4)
- Native American Graves Protection and Repatriation Act of 1990 and regulations at 43 CFR 10
- Section 4(f) of the US Department of Transportation Act (23 CFR 138)
- Section 6(f) of the Land and Water Conservation Fund Act
- Executive Order 11988, "Floodplain Management"
- Executive Order 11990, "Protection of Wetlands"
- *Secretary of the Interior's Standards for Treatment of Historic Properties* (36 CFR Part 68)
- NPS *Management Policies 2006*
- Director's Order 77-2: *Floodplain Management*
- Director's Order 77: *Natural Resource Management*
- Director's Order 77-1: *Wetland Protection*
- Occupational Safety and Health Administration Manual on Uniform Traffic Control Devices, 2009 Edition

Subject to the final design and approval of plans by relevant agencies, resource protection measures would include, but would not be limited to, the items below. These protection measures are considered part of the alternatives, and they would be implemented to avoid or reduce impacts on park resources and values.

## General

- To minimize the amount of ground disturbance, staging and stockpiling areas would be located in previously disturbed sites, including the roadway and gravel pullouts, away from visitor use areas to the extent possible. Staging and stockpiling areas would be restored to pre-construction conditions following construction.
- Construction zones would be identified and fenced with construction fencing or similar material prior to any construction activity. The fencing would define the construction zone and confine activity to the minimum area required for construction. All protection measures identified in this document would be clearly stated in the construction plan specifications, and workers would be instructed to avoid conducting activities beyond the construction zone as defined by the construction zone fencing.
- Construction activities would be limited to daytime hours to avoid impacts on wildlife.
- Fugitive dust generated by construction would be controlled by spraying water on the construction site, if necessary. Vehicle speed on unpaved roads would be limited to further reduce the generation of fugitive dust.
- To reduce air pollution and noise, construction equipment and vehicles would be well-maintained and properly functioning and equipment idling would be limited to only what is necessary for safety and/or mechanical reasons. Equipment and vehicles would also be checked for leaking oil and fluids.
- Confinement techniques (e.g., temporary containment barriers, debris shields) would be used during the removal of the existing bridge and portions of the existing road, as well as the temporary bridge and road, to prevent construction debris (including lead-based paint) from entering Fryingpan Creek and the surrounding environment.
- At the end of each day, the active construction zone would be left in a state that minimizes the obstruction of wildlife movement through the area (e.g., covering holes) and avoids unintentionally attracting wildlife.
- The parking area and surrounding areas would be designed to minimize small wildlife entrapment. Design elements could include a wall design that directs small wildlife away from the parking area and towards the ditch and/or culvert that would contain small openings, or the bottom of the barrier wall that would allow for the passage of small wildlife.
- Based on results of geotechnical investigations, any necessary blasting would be minimized to the extent possible to meet project objectives for the site-specific conditions.
- Blasting would not occur in-water; however, to reduce impacts from flyrock that might move toward the water, blast mats would be laid over the top of the shot to prevent flyrock and disperse some of the sound from the blast.

## Floodplains and Wetlands

- Wetlands would be avoided to the extent possible. Silt fencing would be installed around wetlands prior to construction to minimize impacts on wetland soils and vegetation from heavy equipment.
- Erosion and stormwater runoff would be mitigated through measures such as sediment traps, silt fences, and regular inspection of construction areas for erosion.

- A construction spill prevention, control, and countermeasures plan would be developed and implemented.
- Heavy equipment hydraulic fluid lines would be filled with biodegradable hydraulic oil alternatives.
- Equipment stationed in the dewatered work zones that cannot be readily relocated (i.e., pumps and generators) would be kept in place and refueled or serviced within a secondary containment system. All other equipment must be removed and serviced in a designated, protected area to reduce threats to water quality from vehicle fluid spills. Designated areas would not directly connect to groundwater, surface water, or the storm drain system. The service area would be designated with berms, sandbags, or other barriers. Secondary containment, such as a drain pan, to catch spills or leaks would be used when removing or changing fluids. Fluids would be stored in appropriate containers with covers and properly recycled or disposed of offsite.
- No fuel storage containers would be allowed on the project site. Fuel would be delivered to the site only in pick-up trucks designed for fuel hauling, but it would not be otherwise stored on site.
- Since the culverts to be replaced are in intermittent streams and ditches, culvert construction work would occur when these features are not watered, if possible, to minimize impacts on water quality.
- Once the berms for an isolated work zone are installed, the work zone would be dewatered. The water would be pumped and discharged to an upland location for infiltration to prevent turbid water from entering the waterway. The pump intake would be screened with mesh sized to prevent unintended intake of fish at any life stage.
- Turbidity would be monitored during in-water work. Work would be stopped if the turbidity exceeds the limits set by permitting requirements.
- All work in Fryingpan Creek, including water diversion removal, would occur during the in-water work window.

## Vegetation

- Existing vegetation would be retained to the extent possible. Vegetation outside of the areas that would become impervious surfaces (road and parking areas) would be retained to the greatest extent practicable. Removal of specimen trees — those that are a focal point of the landscape — and trees with a diameter at breast height (DBH) of 18 inches or more would be avoided where feasible.
- Ground protection mats or similar equipment would be placed in the geotechnical work areas to reduce trampling impacts on vegetation from heavy machinery, when possible.
- To avoid transport of nonnative species to the project area, all construction vehicles would be washed and inspected prior to use.
- All material sources and materials, such as topsoil, incorporated into the work area would be certified to be free from noxious weeds, invasive plants, and other deleterious materials by a federal, state, or local public agency. Commercial certifications may be acceptable if materials have been certified through the North American Weed Free Forage Program standard or a similarly recognized certification process. Certifications must include comprehensive lists of introduced plant species located at the material source site. All certifications would be evaluated by park specialists for approval.

- All fill and excavated materials would be covered with tarps when stockpiled to reduce the potential for invasive species establishment.
- Site preparation for revegetation would include surface mulching and vertical mulching, as appropriate, reusing topsoil, logs and other materials harvested from the site when possible. Re-contouring and revegetation of disturbed areas would take place following construction. Revegetation efforts would strive to reconstruct the natural spacing, abundance, and diversity of native plant species using native species. All disturbed areas would be restored as nearly as possible to natural conditions shortly after construction activities are completed.
- Standard BMPs for weed control methods would be implemented to minimize the introduction or spread of noxious weeds.
- During and after construction and following revegetation, restored areas would be monitored and managed to prevent colonization by nonnative invasive species.

## Special Status Species

- Construction workers and supervisors would be informed of the occurrence and status of special status species and would be advised of the potential impacts on the species and potential penalties for taking or harming a federally listed special status species. Contract provisions would require the cessation of construction activities if a special status wildlife species were discovered in the project area and until park staff re-evaluates the impacts of the project on the species. This would allow modification of the contract to include protection measures determined necessary to protect the discovery.
- All blasting and in-water work would be conducted in compliance with the designated in-water work window for bull trout (*Salvelinus confluentus*) and following all avoidance, minimization, and conservation measures resulting from US Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) ESA consultation to minimize impacts on bull trout, Puget Sound steelhead (*Oncorhynchus mykiss*), Puget Sound Chinook salmon (*O. tshawytscha*), pink salmon (*O. gorbuscha*), and coho salmon (*O. kisutch*). The NPS is proposing an in-water work window of June 15 to August 15, but the actual window would be subject to ESA consultation. Timing of construction activities would be coordinated to avoid disturbance to spawning activities of bull trout (including the disturbance of salmonid eggs and fry incubating within stream gravels) by conducting as much on-water work as possible between July 16 and August 15.
- Prior to the in-water work, park biologists would set up block netting ahead of the work to keep fish out of the work area, then remove fish and aquatic species between the netting. Once stream exclusion areas are established, biologists would perform additional fish and aquatic species trapping and relocation, as necessary, before dewatering.
- To the extent possible, current-year northern spotted owl (*Strix occidentalis caurina*) surveys would be performed, and preliminary results would generally be provided in June, although this may occur later in the summer based on staffing levels and ability to access the project site due to snow conditions. Active owl territories would be based on the most recent information available and may change during a season as new information is gained. If surveys reveal owl activity areas have shifted, then construction work would stop and consultation with USFWS would be re-initiated.

- Tree removal would be done outside of the northern spotted owl and marbled murrelet (*Brachyramphus marmoratus*) nesting seasons (March 15 to September 30 and April 1 to September 23, respectively) and the Migratory Bird Treaty Act nesting season (early April – mid-August in Washington) unless the appropriate surveys are conducted, and no listed species are present and no active nesting is occurring in trees proposed for removal. Removal of large trees (18 inches DBH and greater) is proposed to occur in association with the geotechnical investigation and the fall prior to construction and would occur no earlier than the day after Labor Day.
- If gray wolf (*Canis lupus*) dens or rendezvous areas are documented (e.g., through Washington Department of Fish and Wildlife tracking, NPS surveys, or confirmed wildlife sighting reports) within one mile of the action area during the years before or during project implementation, the NPS would reinitiate consultation with the USFWS to determine whether additional conservation measures are needed and if formal consultation is required.
- If an active wolf den or wolf rendezvous site becomes established, no ground-disturbing work would occur within 0.25 mile, until wolves are no longer using the area for denning or as a rendezvous site.
- The contractor would be required to keep all waste and contaminants contained and remove them daily from the work site. Food and other wildlife attractants would be contained to minimize risk of attracting nest predators (i.e., corvids). Other mitigation measures to prevent human-wildlife conflict would include the following: feeding or approaching wildlife would be prohibited; a litter control program would be implemented during construction to eliminate the accumulation of trash; and all food items would be stored inside vehicles, trailers, or wildlife-resistant receptacles except during actual use to prevent attracting wildlife.

## Cultural Landscapes and Historic Structures

- During final design and construction, the NPS would follow the guidance of the *Secretary of the Interior's Standards for the Treatment of Historic Properties.*
- Grading would be done in a manner that produces a naturalistic rough/undulating topography to blend into the landscape, not a hard clean edge.
- Historic materials from the existing bridge would be salvaged during construction activities and reused, either on the new bridge or in other areas within the park.

## Archeological Resources

- The NPS would have archeological monitors on-site during ground disturbance. Should construction unearth previously undiscovered cultural resources, work would be stopped in the area of discovery and the park would consult with the State Historic Preservation Office (SHPO) and the Advisory Council on Historic Preservation, as necessary, according to 36 CFR 800.13, Post Review Discoveries. In the unlikely event that human remains are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act would be followed.
- The NPS would ensure that all contractors and subcontractors are informed of the penalties for illegally collecting artifacts or intentionally damaging paleontological materials, archeological sites, or historic properties. Contractors and subcontractors would also be instructed on

procedures to follow in case previously unknown paleontological or archeological resources are uncovered during construction.

## Visitor Use and Experience

- Sunrise Road (or a temporary road and bridge to bypass the portion of Sunrise Road under construction) would remain open during construction, so visitors could continue to access the facilities and recreational amenities at the Sunrise area. Short-term traffic delays (up to 30 minutes) and longer-term closures (up to one hour a few times a day) may be necessary during specific construction activities. Closures would be kept to a minimum and only implemented, as necessary.
- Seasonal closures could be used to expedite construction. If necessary, these closures would occur during the shoulder seasons when visitation is lower (e.g., June and October).
- The park would coordinate and communicate the construction schedule through press releases, the park website, and other appropriate means to inform visitors of construction activities and short- and longer-term closures.
- During construction activities, safety measures to protect visitors would be implemented. These would include restricting visitors from active work areas, closing the Summerland Trailhead and parking area, and safely storing any hazardous materials required for construction activities.
- The construction contractor would use traffic safety signs and flaggers to inform motorists, bicyclists, and pedestrians and to manage traffic on affected roads during construction activities.

# Appendix C: Alternatives Considered but Dismissed

# ALTERNATIVES CONSIDERED BUT DISMISSED

This appendix summarizes the alternatives that were developed during the early planning process and were considered but not carried forward for further analysis. During civic engagement, the public also suggested another option, which was to add a shuttle service; however, this is outside the scope of this project and would not address the purpose and need for this project.

## Rehabilitate the Existing Bridge on Existing Alignment

Under this alternative, the 1931 Fryingpan Creek Bridge would be rehabilitated on its existing alignment by replacing the concrete bridge deck, repairing (but not replacing) the bridge abutments to address undermining, replacing the rockery wall, conducting lead paint abatement, and repainting the steel structure. The span across Fryingpan Creek would remain 128 feet and would continue to constrict Fryingpan Creek since its abutments would remain in the channel. This alternative would include retaining existing parking on the downstream side of the road and requiring visitors to cross the roadway for trailhead access and to view the creek from the bridge (without sidewalks). This alternative would retain some of the contributing elements of the NHLD (bridge structure, road alignment, specimen trees, and vistas). As noted in chapter 1, the Fryingpan Creek Bridge has exceeded its 75-year design lifespan, and rehabilitating the bridge would extend this lifespan but by an unknown amount of time.

This alternative would require the installation of a temporary bridge for construction access and to retain park operations and visitor access to the Sunrise area during bridge rehabilitation. It would require two to three construction seasons to finish the project, including construction traffic delays and potential temporary closures of the bridge, as well as the removal of vegetation.

This alternative was considered but dismissed due to a number of reasons. The life cycle cost for this alternative assumes that a full bridge structure replacement would be needed in 10 to 15 years, even with bridge rehabilitation in 2023. Therefore, rehabilitation of the bridge would only be a short-term solution. Further, this alternative would not meet accessibility requirements or remove the abutments from the creek channel and would continue to constrict its flow. As a result, this rehabilitation alternative would have similar resource impacts as the other action alternatives that would have much longer lifespans and would remove the abutments from the floodplain. It could also result in more resource impacts from the installation of a temporary bridge a second time. This would likely result in additional permanent damage to natural resources, as the repeated vegetation removal in a relatively short time span would not allow the vegetation communities to regenerate. This alternative would not provide overall resilience to projected changes in creek flow levels in the future given anticipated changes to the rate of upstream melting of glaciers and predicted increases in rainfall and rain-on-snow weather events in the future.

## New Bridge on the Existing Alignment with the Existing Bridge Width and Span

This alternative would involve constructing a new bridge on the existing alignment while retaining the existing dimensions of the alignment (approximately 128 feet by 31 feet). The new bridge would have a new, deeper foundation. Although some elements of the new bridge would be different than the current bridge, the new bridge would be designed to look similar (e.g., arch of the steel girder) to the existing bridge to retain the bridge alignment and roadway curvature. Keeping the new bridge on the existing alignment within the existing footprint would retain as many of the character-defining features of the NHLD structure as possible while still being able to reconstruct the bridge.

Because the existing width of the bridge would be maintained, the replacement bridge would not have a sidewalk, requiring visitors to continue to walk along the roadway for views of the creek. The bridge would also not meet accessibility requirements. A temporary bridge would be required during construction to provide construction, operations, and visitor access to the Sunrise area, resulting in additional impacts on natural resources. Although the new bridge could have a 50-year life span, it could also be destroyed or damaged by flooding and would continue to constrict the flow of the creek, as this alternative does not remove the abutments from the floodplain. As a result, it would not provide overall resilience to projected changes in flow levels in the future, given anticipated changes to the rate of upstream melting of glaciers and predicted increases in rainfall and rain-on-snow weather events in the future. Therefore, this alternative is not a viable long-term solution. Due to these reasons, this alternative was considered but dismissed.

## New Bridge on an Alignment Upstream of the Existing Bridge

Constructing a new bridge upstream of the existing bridge was considered but dismissed because an upstream alignment would have a very tight curve and poor alignment of the road leading to the bridge. The uphill elevation changes would also result in additional cut and fill to achieve the necessary horizontal and vertical alignment. The placement of this alignment would also be limited by the proximity to the historic Wonderland Trail and the Wilderness boundary. The Mount Rainier Wilderness currently encompasses approximately 97% of the park with developed areas and roadways identified as non-wilderness. Constructing a new bridge upstream of the existing bridge would not allow for use of the existing paved parking area repurposed as a roadway. The existing paved parking area would be obliterated, as well as the existing road immediately adjacent to the existing bridge. This existing piece of alignment would not be reused as a new parking area on the same side as the trailhead as under alternative B. An upstream alignment would also push the proposed parking area further into the forest resulting in more resource impacts. Overall, this option would have more resource impacts than alternatives B and C and was therefore dismissed.

## New Bridge Downstream of the Existing Bridge and Retain the Existing Bridge

The NPS received several comments during civic engagement, suggesting that the existing bridge be retained for use as a pedestrian bridge after a new bridge is constructed downstream. This idea was dismissed because retaining the existing bridge would result in unsustainable operating and maintenance costs, as well as continued lead paint pollution issues. Also, if the abutments of the existing bridge were to become completely undermined, the bridge could wash downstream and collide with the new bridge resulting in structural damage to the new bridge. Failure of the existing bridge and damage to the new bridge could also result in human health, safety, and environmental impacts. Therefore, this idea was dismissed.

# Appendix D: Construction Equipment

## CONSTRUCTION EQUIPMENT

Table C-1 presents construction equipment that could be used during construction and demolition activities under alternatives B and C, as well as the noise that each piece of equipment would generate.

**Table C-1. Equipment That May be Used during Construction and Demolition and Estimated Noise Generated**

| Equipment | Used During the Following Activities | Impact Device? | Measured Lmax[3] at 50 feet (dBA) |
|---|---|---|---|
| Backhoe | • Access<br>• Bridge construction<br>• Roadway/parking area construction and paving<br>• Existing bridge and roadway removal | No | 78 |
| Chainsaw | • Access | No | 84 |
| Compactor (Ground) | • Roadway/parking area construction and paving | No | 83 |
| Concrete Mixer | • Bridge construction | No | 79 |
| Concrete Pump Truck | • Bridge construction | No | 81 |
| Concrete Saw | • Bridge construction | No | 90 |
| Crane | • Access<br>• Bridge construction<br>• Existing bridge and roadway removal | No | 81 |
| Dozer | • Access<br>• Bridge construction<br>• Roadway/parking area construction and paving<br>• Existing bridge and roadway removal<br>• Site restoration | No | 82 |
| Drill Rig Truck | • Bridge construction | No | 78 |
| Dump Truck | • Access<br>• Bridge construction<br>• Roadway/parking area construction and paving<br>• Existing bridge and roadway removal | No | 76 |
| Excavator | • Access<br>• Bridge construction<br>• Roadway/parking area construction and paving<br>• Existing bridge and roadway removal | No | 81 |
| Front End Loader | • Existing bridge and roadway removal | No | 79 |
| Generator | • Access<br>• Bridge construction | No | 81 |
| Grader | • Access<br>• Roadway/parking area construction and paving<br>• Site restoration | No | N/A |
| Impact Pile Driver | • Access | Yes | 101 |

[3] The $L_{max}$, or maximum sound level, is the highest sound level measured during a single noise event, such as a vehicle passing by a visitor, in which the sound level changes value as time goes on. The maximum sound level is important in judging the interference caused by a noise event with common activities.

| Equipment | Used During the Following Activities | Impact Device? | Measured Lmax[3] at 50 feet (dBA) |
|---|---|---|---|
| Jackhammer | • Access<br>• Existing bridge and roadway removal | Yes | 89 |
| Pavement Scarifier | • Existing bridge and roadway removal | No | 90 |
| Paver | • Roadway/parking area construction and paving | No | 77 |
| Pickup Truck | • Mobilization<br>• Demobilization | No | 75 |
| Pneumatic Tools | • Existing bridge and roadway removal | No | 85 |
| Pumps | • Access<br>• Bridge construction | No | 81 |
| Rivet Gun | • Bridge construction | Yes | 79 |
| Rock Drill | • Access | No | 81 |
| Roller | • Roadway/parking area construction and paving | No | 80 |
| Warning Horn | • Access<br>• Bridge Construction<br>• Roadway/parking area construction and paving<br>• Existing bridge and roadway removal | No | 83 |
| Welder | • Bridge construction | No | 74 |
| Woodchipper | • Preconstruction | No | 75 |

Sources: FHWA 2006; Berger, Neitzel, and Kladden 2010

Table C-2 presents the approximate length of time the construction equipment in table C-1 would be used during construction and demolition activities under alternatives B and C.

**C-2. Duration of Time per Day and per Construction Period of Various Equipment Type**

| Equipment Type | Duration (per day) | Duration (per construction season) | dB Range of Activity |
|---|---|---|---|
| Blasting equipment | 60 minutes or less | 1 to 2 weeks between June 15 and August 15 | 94 |
| Impact pile driver | All daylight hours | Each construction season, June 15 to August 15 | 95 |
| All other equipment | All daylight hours | Each construction season | 75 to 90 |

## References

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2010 *Noise Navigator Sound Level Database with Over 1700 Measurement Values. Version 1.8.*

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## Appendix E: Cumulative Projects Scenario Summary Table

## PROJECTS CONSIDERED IN THE CUMULATIVE EFFECTS ANALYSIS

This appendix summarizes the past, ongoing, and reasonably foreseeable projects that were considered in the analyses of the cumulative effects for the resource topics presented in chapter 3.

**List of Ongoing Previous and Foreseeable Future Actions and Land Uses**

| Project Name | Description | Status | Resources Affected |
|---|---|---|---|
| Stevens Canyon Road – Backbone Ridge to Stevens Creek | A portion of Stevens Canyon Road would be improved with new pavement, subsurface stabilization, wall and gutter repairs, and drainage improvement. | Ongoing | Floodplains<br>Wetlands<br>Soils and vegetation<br>Special status species<br>Cultural resources<br>Visitor use and experience |
| Mount Rainier Emergency Repairs | This project consists of emergency repair of the roadway and bank at the Carbon River Entrance. A reinforced soil slope would be constructed with engineered logs and the road would be reconstructed to its original location prior to the 2020 washout. | Future | Soils and vegetation<br>Special status species<br>Visitor use and experience |
| SR-123: Laughingwater Creek Bridge to Panther Creek Bridge | This project includes new pavement, subsurface stabilization, culvert installation, and drainage improvements on the roadway. This project could include temporary closures. | Future | Floodplains<br>Wetlands<br>Soils and vegetation<br>Special status species<br>Cultural resources<br>Visitor use and experience |
| Pavement Preservation Phase 2/West side of the park | This project includes roadway crack sealing/cleaning, pavement patching, and surface treatment on Nisqually-Paradise Road, as well as in paved areas at Cougar Rock, Tahoma Woods, Longmire, and Ricksecker Point. | Future | Soils and vegetation<br>Special status species<br>Cultural resources<br>Visitor use and experience |

| Project Name | Description | Status | Resources Affected |
|---|---|---|---|
| Fairfax Forest Reserve Road East Project (Carbon River Entrance)/ Milepost 5.67 (Poch Creek) to Milepost 7.7 (June Creek) | Fairfax Forest Reserve Road East would be improved by replacing the existing culverts, installing new culverts, resurfacing the pavement, installing a guardrail, and rehabilitating the Tolmie Creek Bridge. | Future | Floodplains<br>Wetlands<br>Soils and vegetation<br>Special status species<br>Cultural resources<br>Visitor use and experience |
| Replace Longmire Campground and Community Building Waterlines/Replace Longmire Lift Station/Longmire | The utilities and pump station would be replaced in the Longmire area. | Future | Soils and vegetation<br>Visitor use and experience |
| Rehabilitate Ohanapecosh Campground/Entire campground | The Ohanapecosh Campground would be improved by rehabilitating the campsites, visitor center, comfort stations, amphitheater, utilities, and roadways. | Future | Floodplains<br>Wetlands<br>Soils and vegetation<br>Special status species<br>Visitor use and experience |
| Rehabilitate Narada Falls Comfort Station and Maintenance Garage | The comfort station and maintenance garage at Narada Falls would be rehabilitated. Ground disturbance would occur in previously disturbed areas. | Future | Visitor use and experience |
| Rehabilitate Sunrise Potable Water System Supply Lines/Sunrise Area | The potable water supply lines in the Sunrise area would be rehabilitated or replaced. Ground disturbance would occur in previously disturbed areas | Future | Special status species<br>Visitor use and experience |
| Rehabilitate Paradise/ Longmire wastewater treatment plants/ Longmire and Paradise Area | The wastewater treatment plant would be rehabilitated, and a new utility main could be added from Paradise to Longmire depending on the design alternative. Some ground disturbance would occur in previously disturbed areas, but there could be some expansion. | Future | Floodplains<br>Soils and vegetation<br>Special status species<br>Cultural resources<br>Visitor use and experience |
| Rehabilitate Deteriorated Paradise Area Day-Use Facilities/Paradise Area | Deteriorated utilities, facilities, and trails would be rehabilitated in the Paradise day-use area. Some ground disturbance and expansion of previously disturbed areas could occur. | Future | Soils and vegetation<br>Special status species<br>Cultural resources<br>Visitor use and experience |

| Project Name | Description | Status | Resources Affected |
|---|---|---|---|
| Park Operations – Trail Maintenance | The maintenance of hiking trails occurs annually and includes brushing and trail clearing, construction or replacement of minor trail bridges, and the eradication of social trails. | Ongoing | Floodplains<br>Wetlands<br>Soils and vegetation<br>Special status species<br>Cultural resources<br>Visitor use and experience |
| Park Operations – Cyclic Road Maintenance and Plow Operations | Maintaining roads includes brushing, re-grading gravel roads, ditch cleaning, removal of woody debris/logs and live vegetation to promote drainage, invasive plant removal, restriping, pothole repair, surface repairs, ditch and culvert work, and snow plowing. | Ongoing | Floodplains<br>Wetlands<br>Soils and vegetation<br>Special status species<br>Visitor use and experience |
| Park Operations – Bridge Maintenance | Bridge maintenance includes periodic cleaning and repointing of the masonry mortar joints in rock wall areas. Cleaning and resealing of bridge deck joints, with replacement of joint armor as necessary, also occurs periodically. Other bridge maintenance actions include removing debris, cleaning and painting structural steel elements, replacing damaged deck, curbs and railing system components, and periodic replacement of riprap at the bridge abutments to prevent undermining. | Ongoing | Floodplains<br>Wetlands<br>Soils and vegetation<br>Special status species<br>Visitor use and experience |
| Park Operations – Natural Resources Management | Natural resource management activities include monitoring wildlife (e.g., elk, northern spotted owls, bull trout, amphibians, and birds), monitoring forest processes and landscape change, rehabilitation of wilderness camping areas, nonnative plant species removal, and restoration projects, some of which entail helicopter flights. | Ongoing | Floodplains<br>Wetlands<br>Soils and vegetation<br>Special status species<br>Visitor use and experience |

| Project Name | Description | Status | Resources Affected |
|---|---|---|---|
| Park Operations – Hazard Tree Management | Hazard tree activities include monitoring and treating hazard trees within designated areas of the park to protect visitors, staff, and facilities. This management has the potential to remove habitat trees for northern spotted owls, bald eagles, and marbled murrelets, and mitigation measures are used to reduce impacts. Closures around hazard trees and other methods may also be used to protect the public. | Ongoing | Soils and vegetation<br>Special status species<br>Cultural resources<br>Visitor use and experience |
| Early Public Access Development at Mount Rainier | Initial road construction and bridge installations occurred within Mount Rainier National Park during the early 20th century, including the original construction of the Yakima Park Highway (Sunrise Road) and the original construction of the Fryingpan Creek Bridge. Considerable earthwork and vegetation removal was completed during the development of public access within and adjacent to the park. | Complete (maintenance ongoing) | Floodplains<br>Wetlands<br>Soils and vegetation<br>Special status species<br>Cultural Resources<br>Visitor use and experience |

# Appendix F: Public Comment Summary Report

**National Park Service**
**US Department of the Interior**

**Mount Rainier National Park**
**Washington**

# FRYINGPAN CREEK BRIDGE PROJECT

## Civic Engagement Comment Summary Report

**May 2022**

# Acronyms and Abbreviations

| | |
|---|---|
| FHWA | Federal Highway Administration/Western Federal Lands Highway Division |
| NEPA | National Environmental Policy Act |
| NPS | National Park Service |
| park | Mount Rainier National Park |
| PEPC | Planning, Environment, and Public Comment |

## Introduction

The National Park Service (NPS), in cooperation with the Federal Highway Administration/Western Federal Lands Highway Division (FHWA), is in the initial planning phase to replace the Fryingpan Creek Bridge, a contributing historic structure to the Mount Rainier National Historic Landmark District. The project area is located in the northeast portion of Mount Rainier National Park (park) along Sunrise Road, a 15-mile section of highway that provides the sole vehicular access from Mather Memorial Parkway (Highway 410) to the Sunrise Developed Area and White River Campground.

Fryingpan Creek Bridge is approximately 3 miles west of the White River Entrance and is vital to park operations, local economies, and visitor use and enjoyment. The road alignment is also a contributing element to the Mount Rainier National Historic Landmark District, considered the most complete example of NPS master planning in the first half of the 20th century. The developed areas of the park contain some of the nation's best examples of intact NPS Rustic style architecture and naturalistic landscape architecture of the 1920s and 1930s.

This project would ensure sustainable vehicular access on Sunrise Road to the Sunrise Developed Area, White River Campground, and trails in this area of the park. The most current Bridge Inspection Report by FHWA (August 2020) noted that the bridge is in fair to poor condition overall with severe deterioration of the curbs, cracking and flaking on the deck underside, widespread failure of the lead-based paint, and undermining at both abutments (the substructures that support both ends of the bridge).

The NPS notified the public of this proposed bridge project through a press release on March 9, 2022 that was distributed electronically and posted on the NPS Planning, Environment, and Public Comment (PEPC) website, as well as on social media. The press release provided a link to a web presentation (an ArcGIS StoryMap) that provided information about the project area and the preliminary options for management. The NPS also hosted a virtual public meeting in which park, FHWA, and contractor staff presented information on the project and the potential options and held a question-and-answer session. The press release, posts, and virtual meeting notified interested parties of the 30-day comment period that was open through April 9, 2022. The public was encouraged to submit their comments on the Fryingpan Creek Bridge Project electronically through the NPS PEPC website.

## Summary of the Civic Engagement Process

This civic engagement report summarizes comments received during the public review of the potential options for the Fryingpan Creek Bridge Project. During civic engagement, the NPS shares ideas and concepts with the public and stakeholders and collects information to assist in the identification of issues and concerns relevant to a potential project. The web presentation developed for civic engagement included the importance of the Fryingpan Creek Bridge in maintaining access to the Sunrise Developed Area and as an element of the Mount Rainier National Historic Landmark District, the potential issues associated with wetlands, floodplains, and wildlife habitat, the options for repairing or replacing the bridge developed thus far, a timeline of the planning process, and instructions on how to provide comments. The newsletter listed four topic questions to prompt responses from the public:

1. Are there additional options for rehabilitating or replacing the Fryingpan Creek Bridge that the park should consider to help ensure sustainable vehicular access on Sunrise Road?
2. Are there additional resources or potential impacts that the park should evaluate to help inform the bridge design and decision-making process?

3. How would the proposed rehabilitation or replacement of the bridge affect you or your experience at Mount Rainier National Park?
4. Any other comments or concerns you have about the proposed action?

Project information is available at https://parkplanning.nps.gov/bridgeoptions2022. The public will continue to be notified of the project's progress via press releases, website updates, and social media posts. Interested parties are encouraged to visit the NPS PEPC website to view information about this project.

## Definition of Terms

The primary terms used in this document are defined below.

**Correspondence.** A correspondence is an entire document received from a commenter. It can be in the form of a letter, email, written comment form, notecard, or petition. Each piece of correspondence is assigned a unique identification number in the PEPC system.

**Comment.** A comment is a portion of the text within a correspondence that addresses a single subject. It could include information such as an expression of support or opposition to the use of a potential management tool, additional data regarding an existing condition, or suggestions for additional considerations in the impact analysis. Comments were determined to be substantive or non-substantive using Section 4.6, *Circulating Environmental Assessments and Environmental Impact Statements, Soliciting Public Comments, and Responding to Comments*, of the NPS National Environmental Policy Act (NEPA) Handbook as guidance.

**Substantive Comment.** Section 4.6 of the NPS NEPA Handbook defines a substantive comment as a comment that does one or more of the following:

- Question, with reasonable basis, the accuracy of the information in the NEPA document
- Question, with reasonable basis, the adequacy of the environmental analysis
- Present reasonable alternatives other than those presented in the NEPA document
- Cause changes or revisions in the proposal

In other words, substantive comments raise, debate, or question a point of fact or analysis.

## Civic Engagement Public Comment Analysis

The NPS PEPC database was used to manage the comments. The database stores the full text of all correspondence and allows each comment to be coded by topic. The database produces tallies of the total number of correspondences and comments received, can sort and report comments by a particular topic, and provides demographic information on the source of each correspondence. During civic engagement for this project, the NPS received 38 individual correspondences directly through the PEPC system from individuals in four states. Other demographic information is provided in attachment A.

Comment analysis is a process used to compile and combine similar public comments into a format that can be used by decision-makers and the project team. Comment analysis helps the project team in organizing, clarifying, and addressing similar information pursuant to NEPA regulations. It also aids in identifying the topics and issues to be evaluated and considered throughout the planning process.

A coding structure was developed to capture the content of all the comments received and to help sort comments into logical groups by topic and issue. The coding structure was derived from an analysis of the range of topics from public comments. Analysis of the public comments involved assigning codes to comments made in the correspondences. All comments were read and analyzed, and all substantive comments were summarized by developing concern statements, which are provided in the following section. Non-substantive comments received were those in support or opposition to the proposed action or the options presented in the civic engagement materials and comments that were out of scope, meaning that the comments did not pertain directly to the Fryingpan Creek Bridge Project.

## Public Comment Summary

## Comments Questioning the Proposed Action

**Concern Statement:** The NPS should not focus on expanding vehicular access and parking, as it is unsustainable.

## Comments Questioning an Element of the Options

**Concern Statement:** Commenters requested that the costs of the options be provided, as this could factor heavily into which options are supported. The funding source for the repair or replacement of the bridge should also be identified.

**Concern Statement:** Adding toilets at the Summerland trailhead would cause more traffic and parking congestion; visitors may stop to use the toilets, even if they are not planning to hike the trail.

**Concern Statement:** The parking capacity at the Summerland trailhead should not be increased because it would cause congestion on the trail.

## Comments Suggesting a New Option or a New Option Element

**Concern Statement:** The NPS could construct a pedestrian bridge to allow visitors to reach the Summerland trail without walking on the road.

**Concern Statement:** The NPS could also retain the existing bridge, which would allow for additional parking and mitigate impacts on the cultural resource.

**Concern Statement:** The existing bridge should be retained and retrofitted, and the load limit should be lowered.

## Comments Pertaining to Access

**Concern Statement:** Commenters stated that the temporary closures needed to replace the Fryingpan Creek Bridge would be an inconvenience but are necessary to create long-term and reliable access to the Sunrise area. Commenters offered the following suggestions:

- Allow for longer traffic delays or full closure of the bridge and access to the Sunrise area so that the construction could be completed as quickly as possible. Depending on the option selected, this could alleviate the need for a temporary bridge, as construction of a temporary bridge would waste time that could be used for repairing or replacing the bridge.
- Limit construction to later in the day to allow for visitor access in the earlier part of the day.

- Begin construction activities before and end them after seasonal closures are implemented for visitors — as the weather allows — to advance construction activities before periods of higher visitation.
- Since parking would be affected during construction, consider allowing visitors to park at the White River Campground camping loops and installing signs to direct Summerland trail hikers on where to park and how to access the trail.
- Close the White River Campground to reduce the number of larger vehicles on the bridge.
- Give access priority to travelers in uniform or visitors with valid Wonderland Trail permits when there are construction delays.
- Construct a temporary bridge downstream to allow for continued access.

**Concern Statement:** Provide information on the expected timeline for construction so visitors, including timing and expected delays, so that visitors can plan for delays.

**Concern Statement:** Some commenters suggested that the NPS provide mass transportation for accessing the Sunrise area, such as shuttles or buses. This would provide an alternative for visitors who do not drive or for any visitors during periods of peak visitation when parking could be an issue. Having buses or shuttles routinely crossing the bridge may require changes to the design. Several commenters noted that bicycle access and hiking to trailheads should also be encouraged.

**Concern Statement:** Without access to the Sunrise area and White River campground, visitors would use other parts of the park, potentially increasing congestion in those areas.

## Comments Pertaining to Construction Materials, Specifications, and Methods

**Concern Statement:** Commenters offered the following suggestions related to construction materials, specifications, and methods:

- Use accelerated construction techniques to slide out the existing bridge and slide in the replacement. This would shorten the construction schedule but would not allow for a wider bridge span.
- Use asphalt reinforced with aramid fibers to increase the life of the asphalt.
- Construct the embankments using large boulders for the base and reinforced concrete for the driving surface and install prestressed concrete I-Beams to connect the two embankments. The embankments should be placed such that high water would not affect the structural integrity. This design would require minimal maintenance.

**Concern Statement:** The limitations of the haul roads outside of the project area and outside of the park, if necessary, should be analyzed to ensure that they would not be damaged by large construction vehicles or trucks transporting construction materials to the Fryingpan Creek Bridge site.

**Concern Statement:** The NPS should provide information for each option, such as steel fatigue, corrosion, and projected load-bearing capacity.

## Comments Pertaining to Cultural Resources

**Concern Statement:** Commenters acknowledged that there would be impacts on the historic bridge but maintaining safety and access is more important.

**Concern Statement:** The adverse effects on the historic bridge could be mitigated by restoring the historic rock walls on Westside Road on the western side of the park.

**Concern Statement:** The NPS should describe the importance of the existing Fryingpan Creek Bridge, including whether there are other similar structures in the park, the level of public attachment to the bridge, whether there are interesting facts about the construction of the bridge, and if the views of the bridge are historic.

**Concern Statement:** The materials and design of a new bridge should be similar to the existing bridge, matching aesthetics and the rustic elements of the existing bridge and remaining compatible with the environmental setting.

**Concern Statement:** Using salvaged historic rock material or historically appropriate material to retain the historic look and feel of the existing bridge can be difficult to execute properly. Some cultural resource managers do not prefer simulated rock work.

## Comments Pertaining to Natural Resources

**Concern Statement:** The civic engagement materials did not fully address the restoration of impacts caused by a temporary bridge or the existing bridge if option B were implemented.

**Concern Statement:** The potential impacts on Chinook and coho salmon should be analyzed. Although these species have not been documented within the project area, there is potential for them to occur.

**Concern Statement:** The NPS should identify any restrictions on noise levels or vibrations during construction, as impacts from noise and vibrations could affect wildlife habitats.

**Concern Statement:** The NPS should disclose whether the lead paint on the existing bridge needs to be remediated immediately and if the chipping paint is currently having an impact on fish or water quality.

**Concern Statement:** Installing toilets near the trailhead would limit the impacts from human waste on natural areas.

## Comments Pertaining to Safety

**Concern Statement:** Parallel parking along Sunrise Road should be limited, as this presents safety issues during peak visitation.

**Concern Statement:** Americans with Disabilities Act (ADA) accessibility standards and Washington State Department of Transportation requirements are not met under all the options presented in the civic engagement materials.

## Comments Pertaining to Visitor Use

**Concern Statement:** The bridge should be replaced to be long-term, fully functional, and provide access to a variety of recreational opportunities at the park for as many visitors as possible.

## Comments Pertaining to Wilderness

**Concern Statement:** Increasing the parking capacity at the Summerland trailhead would increase congestion and impact the wilderness experience.

# Attachment A: Public Comment Content Summary

The following tables are produced from PEPC and provide information on the numbers and types of comments received, as well as demographic information.

**Table 1: Correspondence Count by Correspondence Type**

| Type of Correspondence | Number of Correspondences | Percentage |
|---|---|---|
| Web Form (PEPC) | 38 | 100 |

**Table 2: Geographic Distribution of Public Comments by State**

| State | Number of Correspondences | Percentage |
|---|---|---|
| Washington | 35 | 92.1 |
| Montana | 1 | 2.6 |
| North Carolina | 1 | 2.6 |
| Texas | 1 | 2.6 |

Commenters have an opportunity to list an agency or organization when entering their information and commenting in PEPC. The following agencies and organizations were provided by commenters.

- Meadow Rovers
- Mount Rainier National Park Associates
- Renton Women's Hiking Group