



National Park Service
U.S. Department of the Interior
Yellowstone National Park
Idaho, Montana, Wyoming

Lewis River Bridge Replacement Environmental Assessment

October 2018



Existing Lewis River Bridge

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PURPOSE AND NEED

Purpose and Need for Action

The National Park Service (NPS), in conjunction with the Federal Highway Administration (FHWA), is proposing to replace the Lewis River Bridge located on the South Entrance Road, 9.8 miles north of the south entrance, within Yellowstone National Park. Construction is anticipated to begin in the summer/fall of 2020 and continue through 2022. In addition to replacing the bridge, the adjacent Lewis River Falls parking area would be reconfigured and slightly expanded to reduce traffic hazards to visitors.

The purpose of this project is to replace the Lewis River Bridge, improve safety for drivers and pedestrians, improve visitor experience, and address parking congestion near the bridge. This project is needed because:

- Lewis River Bridge is listed as a Priority of Improvement Category B (Major) in the latest bridge safety inspection (9/16/16). Category B means “Structure is seriously deficient or presents a safety hazard, but can remain in service at reduced loads or with frequent inspections.”
- The bridge has widespread deterioration of the deck, abutments and wing walls exhibit widespread cracking delamination and spalling, and is deemed as “Scour Critical.”
- The bridge has 3-foot sidewalks, which are a sub-standard width and could be a safety hazard.
- This site is popular for viewing Lewis Falls. Parking is on the south side of the bridge and does not meet current visitation needs, leading to congestion along the road. The parking area also has turning and sight distance issues and potential for vehicle-pedestrian conflicts.

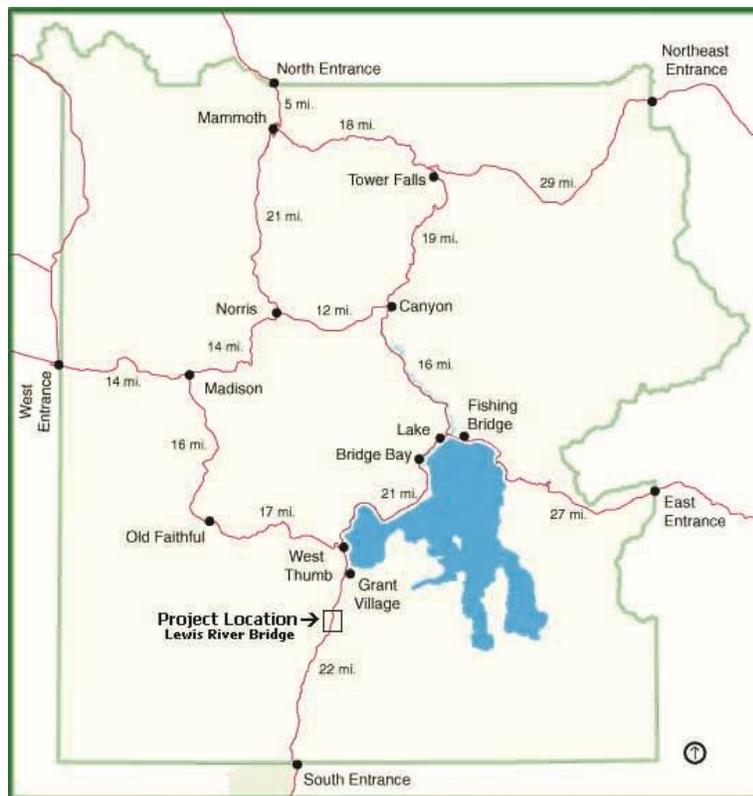


Figure 1. Project location.



Figure 2. Lewis River Bridge looking north, located on the South Entrance Road.

Summary of Project Objectives

- Bring the bridge structure back to excellent condition for the long term.
- Improve pedestrian safety.
- Reduce localized vehicle congestion.

Impact Topics Retained for Further Analysis

The following topics are carried forward for further analysis in this Environmental Assessment (EA):

- Wetlands
- Visitor Use and Experience
- Wild and Scenic Rivers

Impact Topics Dismissed from Further Analysis

Table 1 indicates which impact topics were dismissed from further analysis, along with rationale for dismissal. The table also includes the law, regulation, and/or policy that govern the compliance for that particular impact topic and a brief

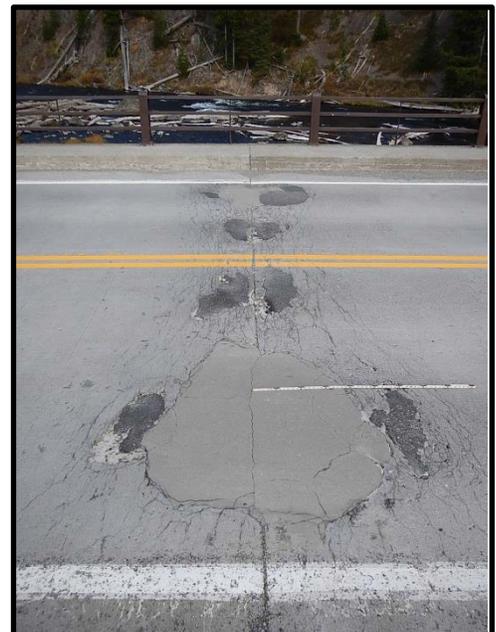


Figure 3. Typical deterioration of east exterior edge of deck and sidewalk with exposed rebar (span #1 at pier #1 shown).

description of the affected environment, or baseline conditions, in the project area.

Table 1. Impact topics dismissed from further analysis.

Topic	Reason Dismissed
Air Quality & Green House Gas Emissions	<p>Yellowstone National Park is designated as a Class I air quality area under the Clean Air Act; meaning, this area receives the highest level of protection with only a small amount of additional air pollution allowed. Air pollutants (i.e., ozone, nitrogen, sulfur, and mercury) directly impact Yellowstone by reducing visibility, contaminating vegetation, soils, and surface waters, as well as disrupting lifecycle and behavior patterns of certain wildlife species.</p> <p>Use of construction equipment would also result in a limited increase of Green House Gas emissions (GHGs) in the project area. Traffic delays in the project area would also result in vehicle idling. Both of these activities would result in a localized increase of vehicle exhaust, emissions, and fugitive dust throughout the two construction seasons. Both air pollutants and GHGs are produced through these emissions. Periodic use (i.e., hourly) of various types of equipment (excavators, backhoes, cranes, pavers, and material delivery trucks) during the construction period would produce emissions that would be very small relative to those produced from visitor travel throughout the park and would make an inconsequential contribution to the park's overall emissions profile. Any increase in GHGs would cease once construction is complete; therefore, no lasting effects from the contribution of GHGs would occur under either Alternative discussed in this EA.</p>
Thermal Features	<p>Where the Lewis River begins at the southernmost tip of Lewis Lake, there are several thermal features along both sides of the shoreline, with beaches consisting of small alluvial cobbles and pebbles. These thermal features are about 0.5 miles northwest of the project site and would not be impacted by either alternative.</p>
Floodplains	<p>Temporary piers needed for work bridges would not impact the Lewis River floodplain or inhibit its function. The action alternative proposes a single pier for a replacement bridge, rather than maintaining the four piers of the current bridge; these four piers are located in the river channel. Because of the reduction of piers in the channel, floodplain function would be improved in the action-alternative. The no-action alternative would not change floodplain function; therefore, this topic has been dismissed.</p>
Water Resources	<p>The Lewis River obtains most of its flow from Lewis Lake, which can remain frozen as late as June, creating massive runoff episodes during late spring and early summer.</p> <p>Water for dust control and compaction of road base materials would be drawn from the Lewis River, Lewis Lake, or hydrants within developed areas such as Grant and the South Entrance. Water used would not be allowed to migrate back to the river or lake, and all equipment used for pumping and hauling would be decontaminated prior to use to prevent the potential spread of aquatic invasive species. Fueling of equipment would occur at least 150 feet from surface waters. No contamination of park waters or sedimentation of these waters would occur from proposed activities. Some sediment could</p>

Topic	Reason Dismissed
	<p>be stirred up for a day or two during the removal of existing bridge's abutments and piers.</p> <p>Construction vehicles have the potential to introduce pollutants and increase sedimentation into the river and decreased water quality; however, mitigation measures and best management practices, such as checking equipment for leaks prior to use, working in seasonally wet areas during the dry periods, and containing pile driving activities would be used to mitigate the risk of any adverse effects.</p> <p>If needed, coffer dams would be used during the removal of the abutments and/or piers of the Lewis River Bridge. These coffer dams would contain any sediment generated and prevent increased turbidity in the river. If dewatering of the coffer dams is required, it would be removed via a vacuum truck, or pumped via a pipe or hose to the upland area north and west of the current bridge.</p> <p>Much of the work done to remove the existing abutments and piers would be accomplished from a proposed work bridge that would allow excavators to pull these structures without the need to enter the river channel.</p> <p>The installation of piles can disturb bottom sediments and may cause a temporary increase in suspended sediment in the project area. Turbidity curtains would be used if needed to contain turbidity. In-water work would occur for pile-driving and pier construction, and for removal of the abutments and piers. Potential impacts to water quality would last only as long as these in-water activities, which are expected to last for a few weeks.</p> <p>Mitigation measures described above are expected to reduce any impacts to water quality to a level that they would not impact fish or visitor experience. As there would be no lasting effects on water quality, and any impacts would be at a level that would not cause concern for other park resources, this topic has been dismissed from further discussion in this document.</p>
Vegetation and Soils	<p>Yellowstone National Park has over 1,350 species of vascular plants. Fluctuations in elevation, precipitation, and topography also help to shape the diverse patterns of plant life found throughout the park.</p> <p>The majority of Lewis Lake and Lewis River corridor consist of mixed conifer forests. These forests contain varieties of spruce, fir, and aspen, though lodgepole pine generally dominates.</p> <p>The Lewis River riparian zone generally consists of young pines and short bunch grasses on alluvial loams or rhyolitic gravel with similar vegetation. The shores of Lewis Lake feature thick riparian areas with the occasional open beach transitioning to dense tall grasses, often congested with sandbar willows.</p> <p>Ancient lake terraces rising above the current shores of Lewis Lake generally contain sparse pines with open grassy meadows containing impressive arrays of wildflowers, especially Castilleja or Indian Paintbrush. Other terrace formations along Lewis Lake and Lewis River have extremely dense pine</p>

Topic	Reason Dismissed
	<p>forests, as previously mentioned, creating a diverse and densely populated vegetative habitat in these lake and riverine locales.</p> <p>Approximately half of the five-acre project area is in the footprint of the existing bridge, parking area, pullouts, and road. Much of the site has been disturbed in the past from either road cuts or fills associated with the construction of the existing road. Much of this area is comprised of compacted dirt with some native and non-native invasive species.</p> <p>Realignment of the road to the east, and expansion of the main parking area, in the preferred alternative would result a loss of 2.04 acres of vegetation and topsoil. However, some of the old road alignment would be restored by seeding and/or planting native grasses and forbs. Some native vegetation would also be removed prior to construction, salvaged, and replanted after construction. Once restoration actions are complete, the net loss of native vegetation would be negligible when considering the scale of the Lewis River drainage.</p> <p>Transplant and revegetation efforts would be coordinated through the Yellowstone Vegetation Program. Any exotic or non-native vegetation located in the project area throughout revegetation efforts would be removed, thereby reducing competition with native plants and preventing the establishment of additional exotic vegetation. Any topsoil excavated during the project would be used near its original location or stored in park stockpiles for future projects. Because of the planned revegetation efforts described above, as well as the small area of permanent vegetation loss, this impact topic has been dismissed from further analysis.</p>
Fish and Wildlife	<p>Yellowstone has a diverse ecosystem, which is currently home to many large mammals: bison, elk, moose, big horn sheep, deer, antelope, grizzly and black bears, mountain lions, coyotes, and wolves. A variety of birds and other small animals are also present in the region.</p> <p>The Lewis River Bridge project area is outside of the known annual range for bison. Currently, bison range only as far south as Old Faithful (Marcus et al. 2012).</p> <p>The project area does fall within the summer migration ranges of some elk herds, and there is strong evidence for their presence in the area in the form of large antler sheds and skulls. Due to the localized area of the project and since elk are dispersed in their movements, and there is not a specific migration route in this area, the project would not have any lasting effects on elk.</p> <p>Moose were observed in 2014 by a University of Montana (UM) crew doing archeological surveys in the riparian zones of the lower Lewis River. Moose use habitat throughout the Lewis River watershed. Since the proposed project occurs within a very localized area, and there is abundant habitat (riparian areas) outside the immediate action area of the project, there would be no lasting effects on moose from this project.</p>

Topic	Reason Dismissed
	<p>Between 1979 and 2009 the region of Lewis Lake and the Lewis River had a low number of female grizzly bear sightings and low observed grizzly bear deaths (Marcus et al. 2012). According to (F. T. van Manen, et. al.) grizzly bear mortality has been trending down from 1959 to 2017. As no road speed increases are proposed, and traffic will be slower in the construction zone, other than temporary displacement, no impacts to grizzly bears would occur.</p> <p>Although wolves of the Bechler pack were reported in 2006 to occupy the southwest corner of the park (Marcus et al. 2012), most research and monitoring efforts indicate the Lewis River area is unoccupied by wolves.</p> <p>Currently, Canada lynx (<i>Lynx canadensis</i>) and grizzly bear are the only listed species under the Endangered Species Act found in the park. The Lewis River Bridge project area lies outside of designated Critical Habitat for the lynx and there is no known lynx occupation near the project area; therefore, this project would have no effect on the lynx.</p> <p>Because mitigation measures would be implemented to inform project workers about food storage, bear safety, and bear encounters, and since the project site is not commonly used by grizzly bears because it is in a high visitor use area located within the South Entrance Road corridor with a 25 mph speed limit, this project would not likely adversely affect grizzly bears.</p> <p>The Lewis River Bridge project is included as part of a Parkwide Roads Program for which Section 7 has been completed. The Parkwide Road Biological Assessment was submitted to U.S. Fish and Wildlife Service (USFWS) in 2008 and the subsequent Biological Opinion prepared by the USFWS was completed in 2009 for the Yellowstone Park Roads Program. Because the Section 7 requirements of the ESA for this project is complete, the topic of threatened and endangered species has been dismissed from further analysis as an impact topic.</p> <p>Wildlife and bird species currently utilizing the area are acclimated to high volumes of vehicle and visitor use as a result of the nearby developments in the area (i.e., Lewis Falls Overlook, Lewis Lake Campground, South Entrance station, and the Grant developed area). Wildlife species are expected to continue to use these areas in spite of construction activities, though some may be displaced from the immediate area of operating construction equipment for two construction seasons. Because most construction activities would occur in the same areas and during the season of highest visitor use, animals have already been displaced from visitor activity in the project area. Equipment would operate from April through November until expected project completion in two-plus years. While blasting would be required for this project, it is anticipated that displacement of wildlife would be temporary and localized during this activity. Native revegetation efforts with grasses and forbs would reestablish some habitat for the species noted above.</p> <p>Noise in the project area has the potential to impact nesting birds, wildlife, and campers using the Lewis Lake Campground. Bird vocalizations when trying to find mates could be muffled and potential nesting sites near this activity may not be used. Birds with active nests would be unlikely to</p>

Topic	Reason Dismissed
	<p>abandon nests, and wildlife may choose sites further away to bear young. Noise would essentially cause a temporary habitat loss during construction; however, habitat along the South Entrance Road is abundant for both birds and wildlife.</p> <p>Lewis River and Lewis Lake support populations of mountain whitefish and Yellowstone cutthroat trout, with non-native species of lake trout, brook trout, and brown trout (Marcus et al. 2012). The fish in the Lewis River downstream of the bridge are primarily non-native brown trout, which are fall spawners.</p> <p>Fish protection measures to be used on this project include coffer dams, erosion control devices, and sediment curtains. These measures would be employed when needed in order to avoid large releases of sediment downstream. They would help avoid sedimentation of the gravel river bottom needed for fish spawning. Construction activities would be timed to occur to cause the least impact to spawning fish.</p> <p>Scheduling of in water work and monitoring of turbidity levels would occur to ensure that sediments do not have adverse impacts to spawning fish. Permits for working in a Class I waterway would be obtained on behalf of Yellowstone National Park by FHWA prior to construction and all stipulations of that permit would be followed. These permits stipulate that turbidity levels cannot exceed predetermined levels at a given distance downstream from the project. These stipulations are in place to keep water quality at a level that would not impact fish species in the river.</p> <p>The action-alternative would result in approximately two acres of habitat loss adjacent to the road. This same habitat type can be found all along the Lewis River and around Lewis Lake (Stahler 2018). Any effects on fish would be likely not be measurable after mitigation measures are implemented. Because habitat restoration efforts would occur prior to the project being completed, and because past projects had good success with vegetation cover being re-established within about 2 years of completion, this project would not have lasting effects beyond the 2-plus year construction period for wildlife, fish and birds in the area. This topic has thereby been dismissed from further analysis in this document.</p>
Soundscapes	<p>Natural sounds (e.g., flowing water, wind blowing through trees, birds calling) predominate in Yellowstone. However, in the front country, visitors regularly experience the sounds of automobiles and buses, generators, motorized equipment, and other people. Construction projects, often geared toward visitor use improvements, occur periodically throughout the park. Sounds in the project area are a mix of natural and man-made, including those generated from wildlife, humans, vehicular traffic, moving water, and wind.</p> <p>Human-caused sounds would increase during the construction window (April–November) in the project area, including the sounds of mechanical equipment, vehicular traffic, blasting, pile-driving, and construction crews. These sounds would be present for two-plus construction seasons. Construction noise could extend up to a mile beyond the project area. Periodic use (i.e., hourly) of various types of equipment (pavers, tampers,</p>

Topic	Reason Dismissed
	<p>rollers, etc.) over the two construction seasons would produce sounds that are comparatively isolated to those produced from visitor highway transportation within the park and would make an inconsequential contribution to the park’s overall soundscape profile (see Mitigation Measures). Any increase in construction noise would cease once construction is complete; therefore, no lasting impacts to the soundscape would occur under either alternative discussed in this EA.</p>
<p>Lightscaapes</p>	<p>Temporary lighting would be used in the project area to allow night-work during certain periods of construction. Downward lighting fixtures would be used to reduce unwanted illumination of skies. Existing vegetation would screen this light from visitors using the Lewis Lake Campground. Night lighting would be visible from very limited areas along the South Entrance Road. Once construction is complete there would be no change compared to current conditions, and thus there will be no lasting impacts on lightscaapes.</p>
<p>Historic Structures</p>	<p>The Lewis River Bridge is not considered eligible for inclusion on the National Register. The current structure is a steel continuous stringer type bridge with a concrete-cast in-place deck completed in 1960. A program comment from the Advisory Council (Program Comment issued for streamlining Section 106 review for undertakings affecting post-1945 concrete and steel bridges. Federal Register Vol. 77, No. 222, Pg. 68791) indicates bridges of this design and vintage are generally ineligible for inclusion on the National Register, unless located within an historic district. The Lewis River Bridge is located within the South Entrance Road historic district (48YE823), however the bridge is considered non-contributing to the district. In <i>A Context for Common Historic Bridge Types</i>, this type of bridge is considered to be of low significance. In <i>The History of the Construction of the Road System in Yellowstone National Park, 1872-1966</i> (1994), Mary Shivers Culpin considers the bridge to be ineligible for inclusion on the National Register. The 1993 <i>Programmatic Agreement Among National Park Service, the Advisory Council on Historic Preservation, the Wyoming State Historic Preservation Officer, the Montana State Historic Preservation Officer for Principle Park Road System Improvement, Yellowstone National Park</i> stipulates that Historic American Building Record documentation be completed prior to demolition of historic bridges that are determined to be contributing structures to the overall eligibility of the road system as a mitigation measure (§IV.a.). The bridge is not a National Register eligible structure, nor is it a contributing element of any other historic district; therefore, there would be “no adverse affect to historic properties” from this proposed project.</p>
<p>Archeological Resources</p>	<p>An archaeological survey of the Lewis River Bridge was conducted by the University of Montana in August and September of 2017. Approximately 78 acres were surveyed for potential impacts to archeological resources affected by potential realignment/reconstruction of the present-day Lewis River Bridge. During the course of this survey, two isolated finds were located approximately 1,500 meters north-northeast of the proposed project area. One previously recorded site (48YE2216) is located approximately 250</p>

Topic	Reason Dismissed
	<p>meters upstream from the proposed work area. None of these sites will be impacted by the proposed project.</p> <p>Based on the survey efforts mentioned above, there are no known archeological resources located within the proposed project area. Appropriate steps would be taken to protect any unknown archeological resources inadvertently discovered through the implementation of either alternative discussed in this EA (see Mitigation Measures).</p>
Ethnographic Resources	<p>The NPS has previously consulted with Yellowstone's 26 associated tribes regarding the location of any ethnographic resources within the park. The NPS has not been made aware of any ethnographic resources in the project area. The park will continue to consult with the associated tribes who will be asked to comment on this EA as a part of that process. The park has no knowledge of any ethnographic resources that would be affected by the proposed project, therefore this topic has been dismissed from further analysis.</p>
Indian Trust Resources and Sacred Sites	<p>Trust resources are those natural resources reserved by or for Indian tribes through treaties, statutes, judicial decisions, and executive orders, which are protected by fiduciary obligation on the part of the United States. The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes.</p> <p>No trust resources would be affected by this project. The park will continue to provide access to the extent practicable, and permitted by applicable law, and not clearly inconsistent with essential agency functions.</p> <p>Sacred sites are those places having established religious meaning and as locales of private ceremonial activities. Through previous consultation efforts with tribes, the park has not been made aware of any Indian sacred sites at or near the project site. In summary, no Indian Trust Resources nor Sacred sites would be impacted as a result of implementing either Alternative discussed in this EA. Therefore, the issue of Indian Trust Resources and Sacred Sites was dismissed from further analysis.</p>
Environmental Justice	<p>Because the road, parking areas, turnouts, and bridge would be available for use by all people regardless of race or income, and the construction workforces would not be hired based on race or income, the proposed action would not have disproportionate health or environmental effects on minorities or low-income populations.</p>

ALTERNATIVES

Two alternatives, an action and no-action, are carried forward for evaluation in this EA. A number of alternate designs were also considered and dismissed (see Alternatives Considered and Dismissed).

The two alternatives carried forward are:

- Alternative A—No Action/Continuation of Current Practices
- Alternative B—Replace Bridge on New Alignment East of Existing Bridge

These alternatives are based on preliminary designs and the best information available. Specific distances, areas, and layouts are only estimates. The estimates used are at the upper limits of the expected impact for resources. If changes during final site design are inconsistent with the analysis documented in this EA, then additional compliance would be completed.

Alternatives Carried Forward



Figure 4. Existing conditions.

Alternative A—No Action/Continuation of Current Practices

Under Alternative A, no modifications to the landscape or park infrastructure would be made. The 273-foot-long Lewis River Bridge would not be reconstructed or rehabilitated and issues related to the aging of the existing bridge would not be addressed. The bridge width would remain 28-feet 2-inches curb to curb with 3-foot sidewalks on both sides. The NPS would continue to complete short-term and periodic minor repairs and/or improvement activities for continued operation of the bridge, such as patching, rail maintenance, and repair of the deck. Deferring reconstruction would substantially increase the amount of maintenance to maintain

the existing bridge. Deterioration of the structure would continue until safety concerns eventually caused closure or restricted use of the bridge.

The road on both sides and across the bridge would likely need increasing amounts of maintenance as road condition declines. These road maintenance projects would require short traffic delays and closures to complete the work. Travel speed in the area would remain 25 mph. No improvement to the parking area would be made. Safety issues such as undersized parking, congestion at the ends of the bridge, vehicles stopping in the road to view scenery, and narrow road surface would not be addressed. The potential for pedestrian vehicle conflict because of the narrow 3-foot sidewalks on the bridge would continue.

Alternative B—Replace Bridge on New Alignment East of Existing Bridge (NPS Preferred)

Under Alternative B, the Lewis River Bridge would be replaced on a new alignment directly east of the existing bridge. The South Entrance Road would be shifted several hundred feet on either side of the bridge to line up with the new bridge. Traffic would be carried on the existing bridge while the new bridge is under construction. Once construction is complete, the existing Lewis River Bridge would be removed. A temporary work bridge would likely be constructed within the alignment of the new bridge in order to facilitate its construction. This work bridge would be removed prior to completion of the new bridge. Construction is anticipated to last three months the first year (August through October) and up to two full construction seasons (April-November each year) after that.

The existing parking area on the southwest corner of the existing bridge would be reconfigured and expanded by approximately 10,000 square feet. The ingress, egress, and pedestrian areas associated with this parking area would also be improved by expanding turning radii for vehicles and marking parking spaces. The vehicle pullouts on the northeast and northwest of the bridge would be reconstructed in the new bridge location. The pullout located southeast of the bridge would not be retained to avoid additional encroachment on wetlands in the project area.

During construction, visitor traffic would utilize the existing two-way bridge. Delays may occur during working hours for equipment and material maneuvering, including a two-week period where there may be up to six-hour intermittent delays. There would be no delays during hours when no construction activities are occurring. Staging for bridge construction would be within the new alignment and in some locations along the existing alignment.

Replacement of the Lewis River Bridge on a new alignment provides the following opportunities:

- Traffic would utilize the existing bridge while the new bridge was under construction, so no detour would be required and delays for visitors could be minimized.
- Parking areas and ingress/egress at both ends of the new structure could be improved.
- Viewing opportunities of Lewis Falls could be improved.

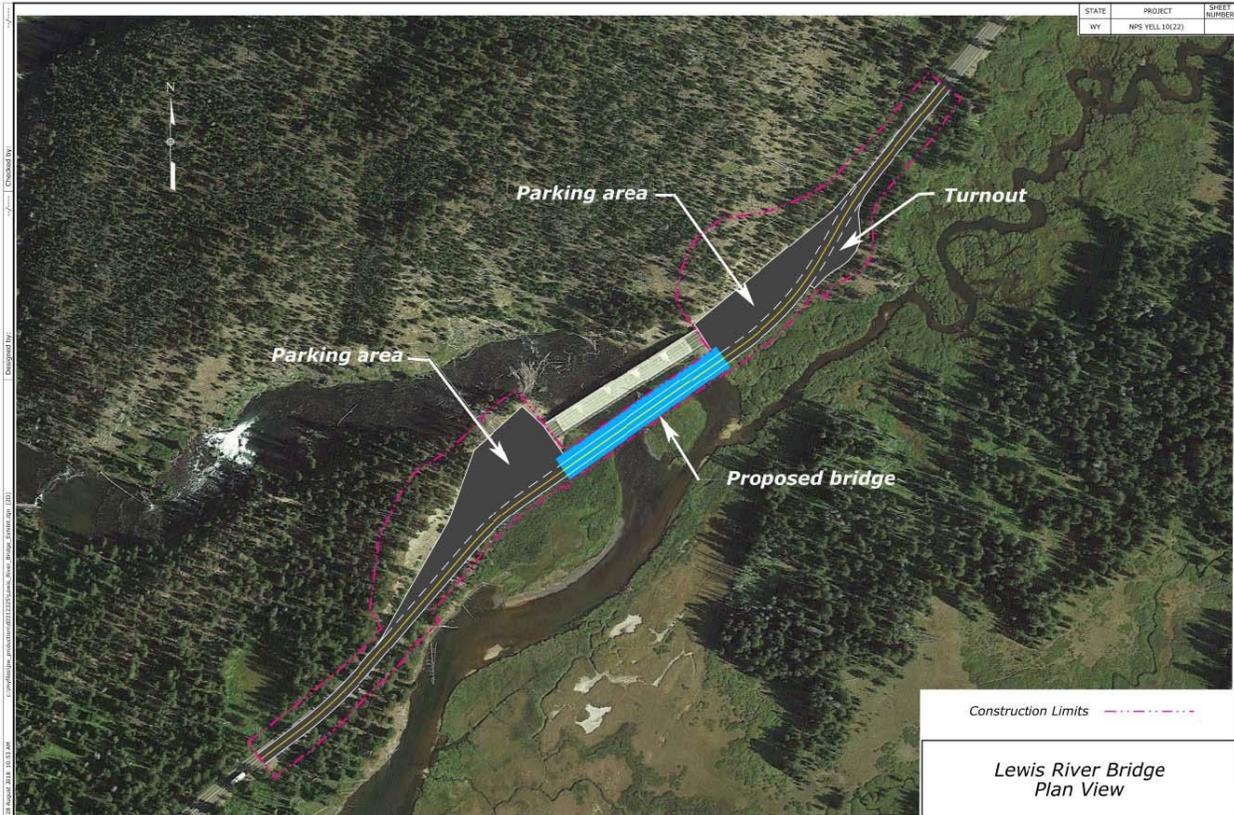


Figure 5. Alternative B (Preferred)—replace bridge on new alignment east of existing bridge.

Project Components

- Lewis River Bridge Replacement** – The centerline of the new bridge would be 40 to 45 feet east of the existing bridge. The new bridge would be approximately 350 feet long with a 30 foot curb-to-curb width (11-foot lanes and 4-foot shoulders) and 6-foot sidewalks on each side (figure 7). The new bridge will be a steel girder with a concrete cast-in-place deck. The bridge would not have any piers in the Lewis River, though the single pier needed would be on an island of the river.
- Abutments** – Cast-in-place concrete abutments would be constructed on site. The exact configuration would be determined by the span layout requirements of the bridge. These abutments would be set outside the ordinary high water level of the Lewis River.
- Pier** – A single pier would be constructed on an island between two channels of the Lewis River. The pier would be drilled or driven in order to reduce impacts in this location.
- Deck** – The deck would be constructed of weathering steel girders with a cast-in-place concrete deck. This deck structure would be supported by the abutments and single pier. A 2-inch asphalt wear surface to match the existing appearance of the driving surface would be added.
- Pedestrian Rails** – The rails would be made of steel in a picket-style similar to other bridges in the park. They would be located only at the outer edges of the bridge, while a curb would separate traffic from pedestrians using the walkways so as not to trap wildlife.
- Driving Surface** – A segment of approximately 0.2 miles of the South Entrance Road would be reconstructed from an existing width of approximately 24 feet to the park standard: a 30-foot paved width. The new width is based on the NPS Park Road

Standards. The 30-foot width would consist of two 11-foot travel lanes and two 4-foot paved shoulders. The bridge would have 6-foot sidewalks on each side. The posted speed would remain 25 mph through this area.

- **Culverts and Headwalls** – Two culverts in the project area would be replaced. The culverts and headwalls would be rehabilitated and reconstructed according to the provisions of the 1992 road programmatic agreement with the Wyoming State Historic Preservation Office, the Advisory Council on Historic Preservation, and the NPS, which allows the masonry headwalls to be moved to a more functional location when necessary but they must retain their original historic look. The historic stone masonry headwalls within the project area would be reconstructed.
- **Retaining Walls** – Retaining walls would be constructed on both the northeast and southeast sides of the new bridge, and adjacent to the bridge abutments at the parking areas, to contain roadkill for the road approaches and to reduce wetland impacts. Retaining walls can be built steeper than the angle of repose for soil slopes, and are used in this case to reduce encroaching further than needed into wetlands from wider approach roads and bridge. The walls would likely be a mechanically stabilized earth (MSE) structure faced with stone or block. Height of the walls would be approximately 8-10 feet at their tallest point.
- **Parking Areas** – The main parking area would be expanded by about 10,000 square feet. This space would be created by shifting the roadway to the east to meet the new bridge location. The parking pullout on the northwest side of the bridge would be reconstructed on the old bridge alignment and the parking pullout on the northeast side of the bridge would be reconstructed on the new bridge alignment; both parking pullouts would be improved with paving and striping. Universal access would be improved with the installation a curb cut and delineated handicap parking space near the bridge. Walkways would be included on each side of the new bridge. A curb would separate traffic from pedestrians.

Construction Details

- **Scheduling of Work Activities** – The project would take approximately two and a half years to complete, likely beginning in summer/fall of 2020 with clearing and material excavation at the northwest end of the existing bridge. Construction of the temporary bridge, removal of the existing bridge, and construction of a new bridge may cause up to 30-minute traffic delays. Night work would likely occur during the project. A few night closures may also be necessary from 11:00 p.m. to 7:00 a.m.; if they occur they would be advertised in advance.
- **Closures** – The Lewis Falls Trail and associated parking area located on the southwest side of the bridge would be closed during the duration of the project. The pullouts located on the northwest and northeast sides of the bridge would also be closed for the same timeframe. The South Entrance Road would remain open except for approximately six closures of about 4-6 hours each, which would be used for launching the girders for the new bridge. These closures would be announced via a press release prior to implementation.
- **Contractor Housing and Temporary Office** – During construction, project contractors would be housed at the established contractor camps in the park, lodging outside the park, or within the developed area at the South Entrance. No housing at the job site would be allowed, though an office trailer is possible at the site or nearby pullouts. All contractor employees would be required to attend and abide by the park's grizzly bear orientation sessions. These sessions focus on topics like proper food and garbage storage, and how to avoid disturbing or encountering bears. Food storage and disposal

procedures at the construction sites and the contractor housing camp would be strictly enforced to minimize the potential for bears to obtain food.

- **Temporary Work Bridge** – A temporary bridge would be constructed on piles within the alignment for the new bridge (figure 5) to help in its construction. The work bridge would be constructed to reduce impacts to wetlands, the river channel, and to help with construction of the replacement bridge. The work bridge would alleviate the need for equipment within the wetlands and river channel by allowing it to work from the deck of the work bridge. It would be removed when no longer needed.
- **Water Source and Water Disposal** – Water would be used for dust control, compaction of base material, asphalt production, and incidental needs related to construction. This water would be drawn from Lewis Lake or the Lewis River, and/or the hydrant at the Grant Maintenance Facility. Any water pulled from water sources within the project area would not be used where it could potentially run into tributaries outside the watershed. Approximately 200,000 gallons would be needed over the duration of the two-year project. Average daily water requirements are not expected to exceed about 700 gallons per day. Use of these water bodies has the least risk of introduction of any aquatic invasive species (AIS) into the Lewis River watershed. Any water transport equipment used would be decontaminated prior to use. Water disposal from dewatering operations would be disposed of at an upland site, likely located in the roadside ditch located west of the road and north of the existing bridge. The existing river shore would be maintained with no alterations or changes to existing hydrology of the river.
- **Erosion Control** – Filter barriers, sedimentation ponds, berms, coir logs, and other best management practices would be used to protect existing water sources and maintain turbidity and sedimentation at the lowest practical level during construction activities. A



Figure 6. View of Lewis Lake in late summer. Photo - Samuel S. White.

storm water pollution prevention plan and a water quality monitoring plan would be required before implementation of the project. Best Management Practices (BMPs) would be used if needed within the river around any in-water work areas, such as abutment and pier removal and placement.

- **Material Sources** – Materials for stone masonry, road base aggregate, asphalt mix, MSE wall backfill, and riprap would be needed for this project. Road base material would be required to build up the road approaches on either side of the bridge (about 5 feet on the south and 2 feet on the north) and allow for drainage under the road. Masonry rock

would be used to face retaining walls, abutments, and the pier. This material would come from the required cut north and west of the existing bridge, from an approved certified weed-free source outside the park, or an existing material stockpile within the park. If suitable stone or aggregate materials are generated from proposed excavations within the job site, these materials would be used within the same job. Much of the material would be processed for use at the South Entrance Pit and/or the Lewis Lake Pit, and would be hauled between the source, the pit, and the job site. This would equate to the following amount of added truck traffic hauling through the park for this proposed project:

Approximately 150 loads of concrete (batched inside the park)
Truck loads from outside the park:
300 for asphalt aggregate
300 for supplemental roadway aggregate
Truck loads from project site to pit for processing:
3,000 loads
Truck loads from pit to project site after processing:
3,000 loads
(Note: all loads = 10 cubic yards)

All loads would be tarped and no engine brakes would be used in or near developed areas or campgrounds. Much of the hauling would occur in the early portions of the project during the earthwork phase at the project site.

- **Material Disposal** – Unsuitable soils or aggregate fill material would be disposed of at existing pits within the park or at an approved location outside the park. Materials from the existing bridge not deemed beneficial to the park would be removed and disposed of properly outside of the park boundaries, at the South Entrance Pit, or if concrete, at the Ice Lake Pit east of Norris Junction. Any excess embankment material generated would be stored for later use at any of the existing maintenance pits within the park. Unsuitable and waste material is anticipated to be approximately 5,000 cubic yards.
- **Staging and Stockpile Areas** – Staging and stockpiling areas would be needed for equipment and materials. These areas would be located in the existing parking area and pullouts adjacent to the bridge, in the Lewis Lake Pit (directly north of Lewis Lake), in the South Entrance Pit located 0.6 miles north of the South Entrance, or in the Grant Village pit (located south of the Ranger Office off the entrance road to Grant Village. All of these pits are currently used by NPS maintenance staff for ongoing maintenance activities within the park. The existing parking lot and turnouts would be closed to visitor use for the duration of the project.
- **Batch Plant Location** – A concrete batch plant and asphalt pug mill would be set up at the South Entrance Pit, the Norris Pit, or the Pumice Pit (all are existing maintenance areas within the park), though no washing of aggregate would occur at these locations.
- **In-Water Work** – Any in-water work involving equipment driving through water bodies or working within a wetland would occur during low flow times of the year. Typically, work within a water body or wetland would be completed from a work bridge. Equipment work in the water would likely only occur to remove abutment and cut off piers below streambed level. The lowest water flow periods within the project limits are typically from August to November. Cofferdams may be used to reduce turbidity.

- **Blasting** – Blasting would likely be needed to accomplish work on the hillside located northwest of the existing bridge. Blasting would occur when: outside of the migratory nesting bird period (after mid-August), or if a survey for nesting birds finds none in the area. Blasting noise is unlikely to be heard at the Lewis Lake Campground due to distance and topography. Blasting would consist of a two month period with one shot approximately every three days. A total of about 15-20 shots would be required. Time between shots would be used to clear material dislodged. Approximately 20,000 cubic yards of material would be dislodged.
- **Pile Driving** – Pile driving would likely be needed for constructing the single bridge pier and the proposed bridge abutments. The duration of pile driving would last approximately two to three weeks and would be timed so as not to impact nesting birds.
- **Excavation** – The hillside located southwest of the bridge, just south of the parking area, would be recontoured to make it less steep in order to promote better revegetation on this over steepened road cut. The hill located northwest of the existing bridge would be excavated about 25-30 feet into the hillside in order to allow for parking at both the northeast and northwest sides of the new bridge.
- **Removal of Existing Bridge** – The existing bridge would be removed and material would be disposed of outside of park boundaries, at the South Entrance Pit, or if concrete, at the Ice Lake Pit. The construction contractor would likely remove the existing bridge by working from one end of the existing bridge and working out to the north or south end. The removal of the existing bridge would require confinement techniques to prevent the construction debris from entering the Lewis River. Potential demolition techniques to minimize environmental impacts include raised netting, tarps suspended beneath the removal area, and use of small equipment. Removing old abutments and piers and installing new ones may require work within the waterway and the construction of coffer dams and could generate some limited turbidity.
- **Reclamation/Revegetation** – Revegetation plantings would use native species from genetic stock originating in the park. Revegetation efforts would be implemented to reconstruct the natural spacing, abundance, and diversity of native plant species. All disturbed areas would be restored as nearly as possible to pre-construction conditions shortly after construction activities are completed. The principal goal would be to avoid interfering with natural processes and to reduce the possibility of infestation of weeds.

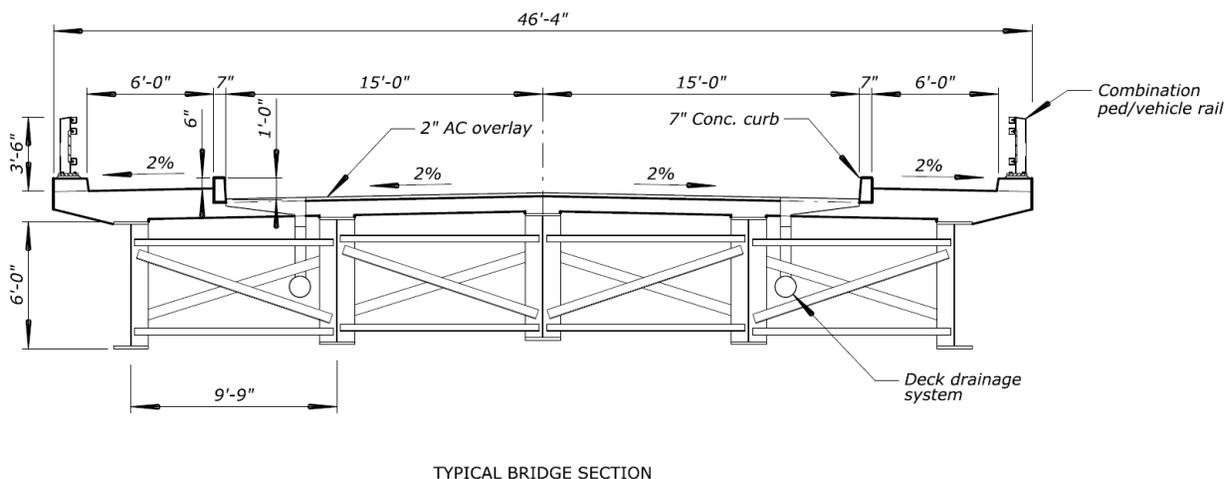


Figure 7. Proposed bridge, section drawing.

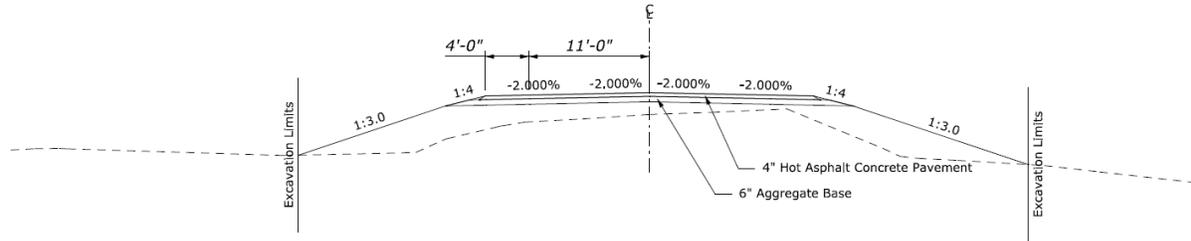


Figure 8. Typical road section to be used for bridge approaches.

Alternatives Considered and Dismissed

The following suggestions and alternative locations for the project were considered but dismissed from further consideration.

Replace Bridge on Existing Alignment/Close Road during Construction

Under this Alternative, the Lewis River Bridge would be replaced on its existing alignment. No temporary bypass bridge to carry traffic would be constructed. A temporary work bridge would be constructed on the northeast side of the existing bridge. Construction would last one season. Traffic on the road would be closed during construction, from April to November. Traffic would not be able to enter or leave the park via the South Entrance Road. Hence, closing the South Entrance Road during construction would adversely impact tens of thousands of visitors, and thus this alternative does not meet the plan purpose and need.

Since this alternative would replace the bridge on the existing alignment, the existing parking areas at the north and south ends of the bridge would not be significantly improved. Due to the location of the river and the existing road, there would be no opportunity to significantly expand or correct ingress/egress issues from the parking areas. Improving parking and safety is part of the purpose and need of the project, and therefore this alternative would not meet the purpose and need.

This alternative also has constructability difficulties due to limited space, and some construction options requiring the public to drive through the construction area, which decreases worker and visitor safety.

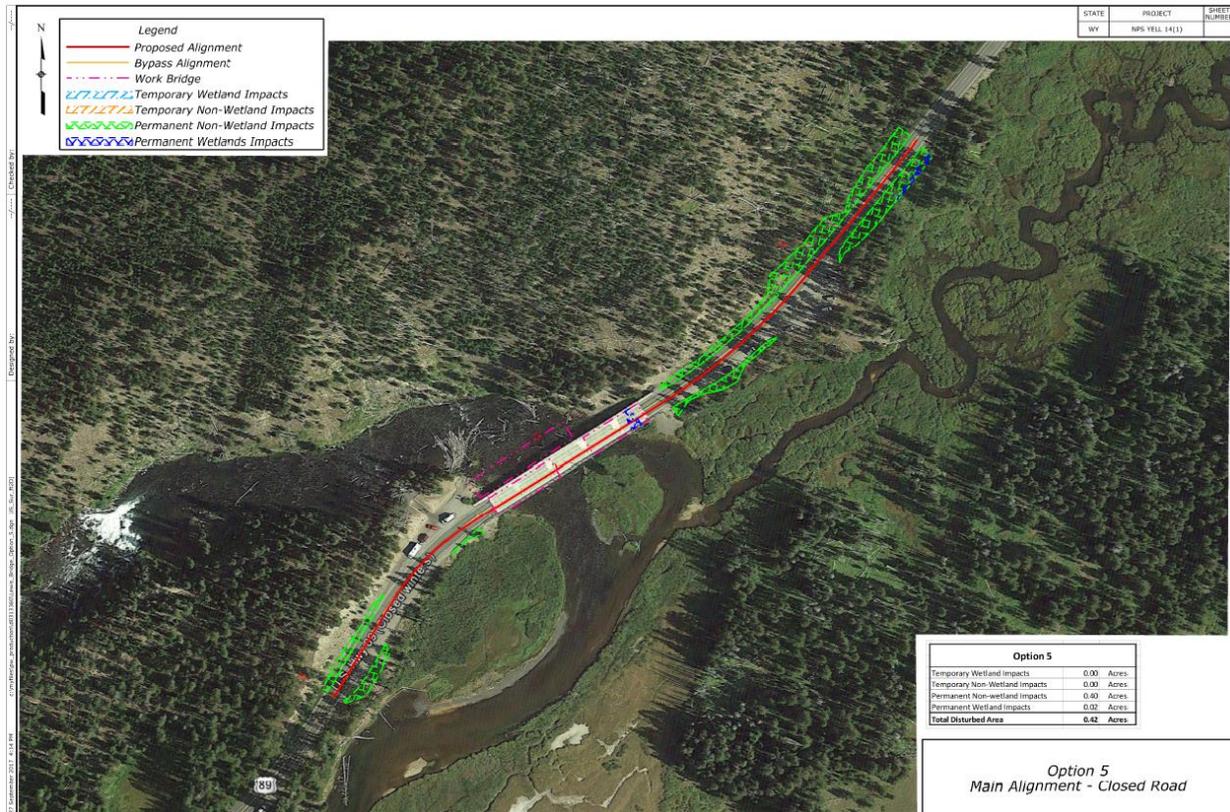


Figure 9. Replace bridge on existing alignment and close road during construction.

Replace Bridge on Existing Alignment/Temporary Bypass Bridge to West

Under this Alternative, the Lewis River Bridge would be replaced on its existing alignment. A one-lane bypass road would be constructed on the west side of the existing bridge. A signal system would be used with 30-minute delays for the duration of the project. The construction contractor would likely build two work bridges which would be used to place equipment and materials during bridge construction: one to the west of the detour bridge and one to the east of the existing bridge. Additionally, public traffic would be diverted through the south side staging/work zone, which would hamper construction activities. Construction would last two seasons. Traffic delays would be limited to 30 minutes. A traffic signal would be incorporated for the temporary one lane bypass road and bridge. No changes to the parking area would occur under this alternative.

The bypass road and bridge would be difficult to construct for this alternative due to limited space for construction, river channel location, and topography of the hill located north and west of the existing bridge. Encroachment into the hill side would be the most impactful of the site. This alternative does not address improve visitor safety at the parking areas, therefore failing to meet all objectives. For these reasons, this alternative was dismissed.

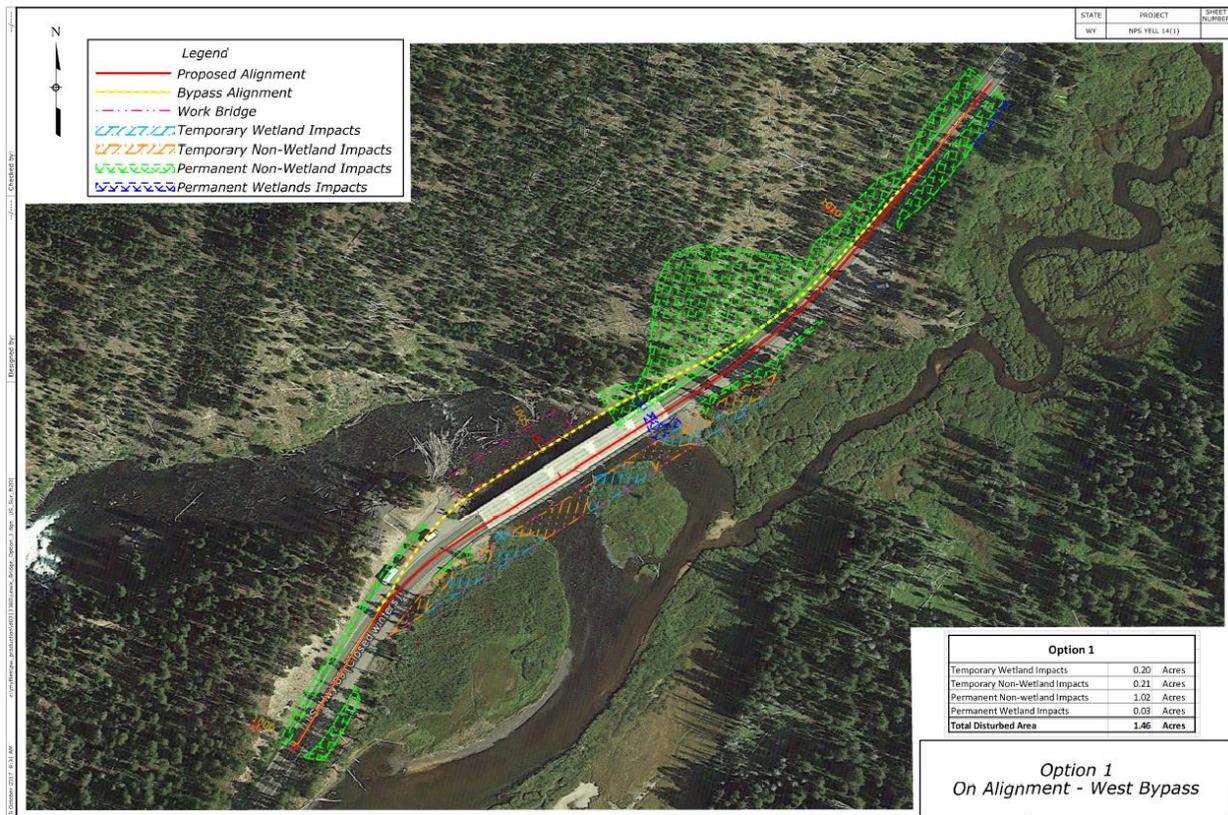


Figure 10. Replace bridge on existing alignment, with temporary bypass bridge to west.

Replace Bridge on Existing Alignment/Temporary Bypass Bridge to East

Under this Alternative, the Lewis River Bridge would be replaced on its existing alignment. A temporary two-lane bypass road and bridge would be constructed on the east side of the existing bridge. A temporary work bridge would be constructed on the west side of the existing bridge. Construction would last two seasons. Traffic impacts would be affected very little due to the temporary two-lane bypass road. The existing parking area would not be changed under this alternative. As Alternative B (NPS Preferred) addressed the improvements to the parking area and generally had the same impacts as this alternative, this alternative was dismissed from further consideration.

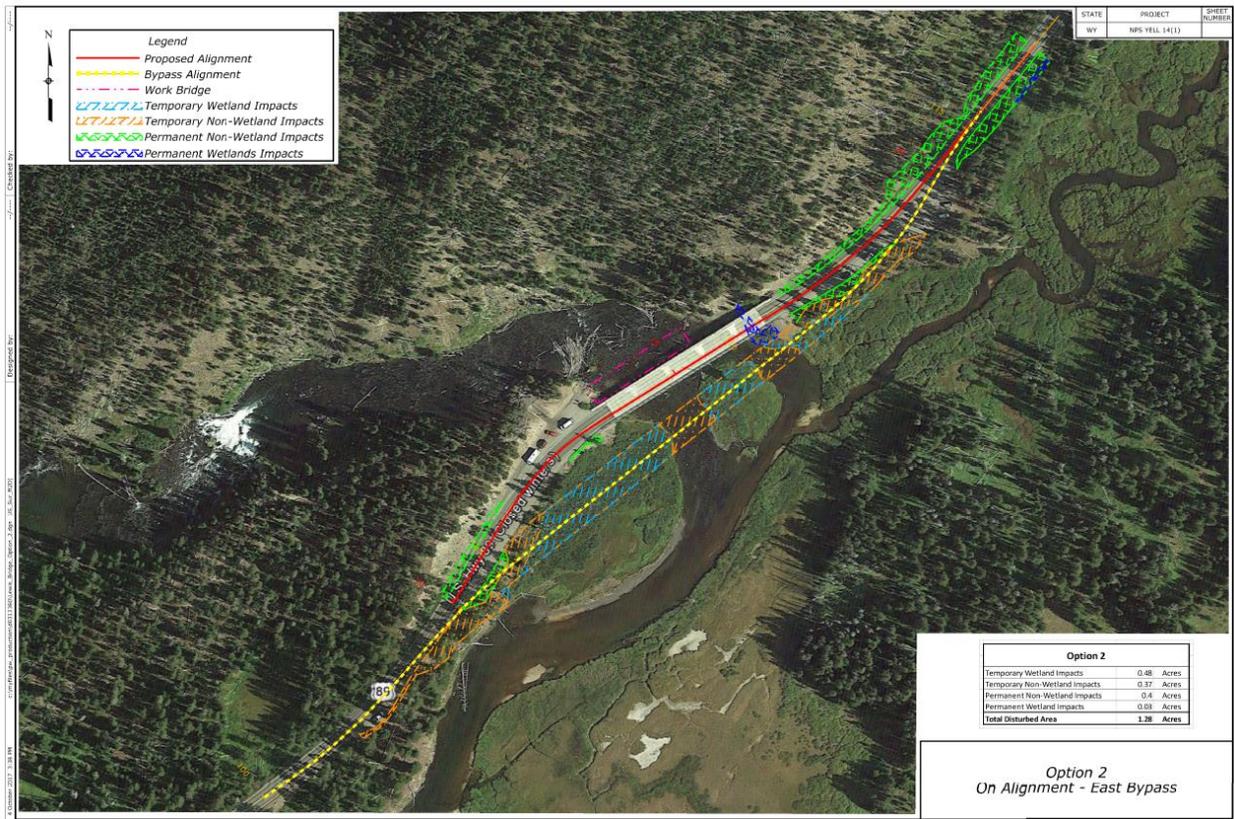


Figure 11. Replace bridge on existing alignment, with temporary bypass bridge to east.

Replace Bridge East of Existing Alignment

Under this Alternative, the Lewis River Bridge would be replaced east of its existing alignment. The existing bridge would carry traffic while a new bridge is under construction. A temporary work bridge would be constructed as shown in figure 11. The temporary work bridge would result in disturbance of new areas compared to Alternative B, and thus it would result in unnecessary adverse resource impacts. Hence, it has been dismissed from further consideration.

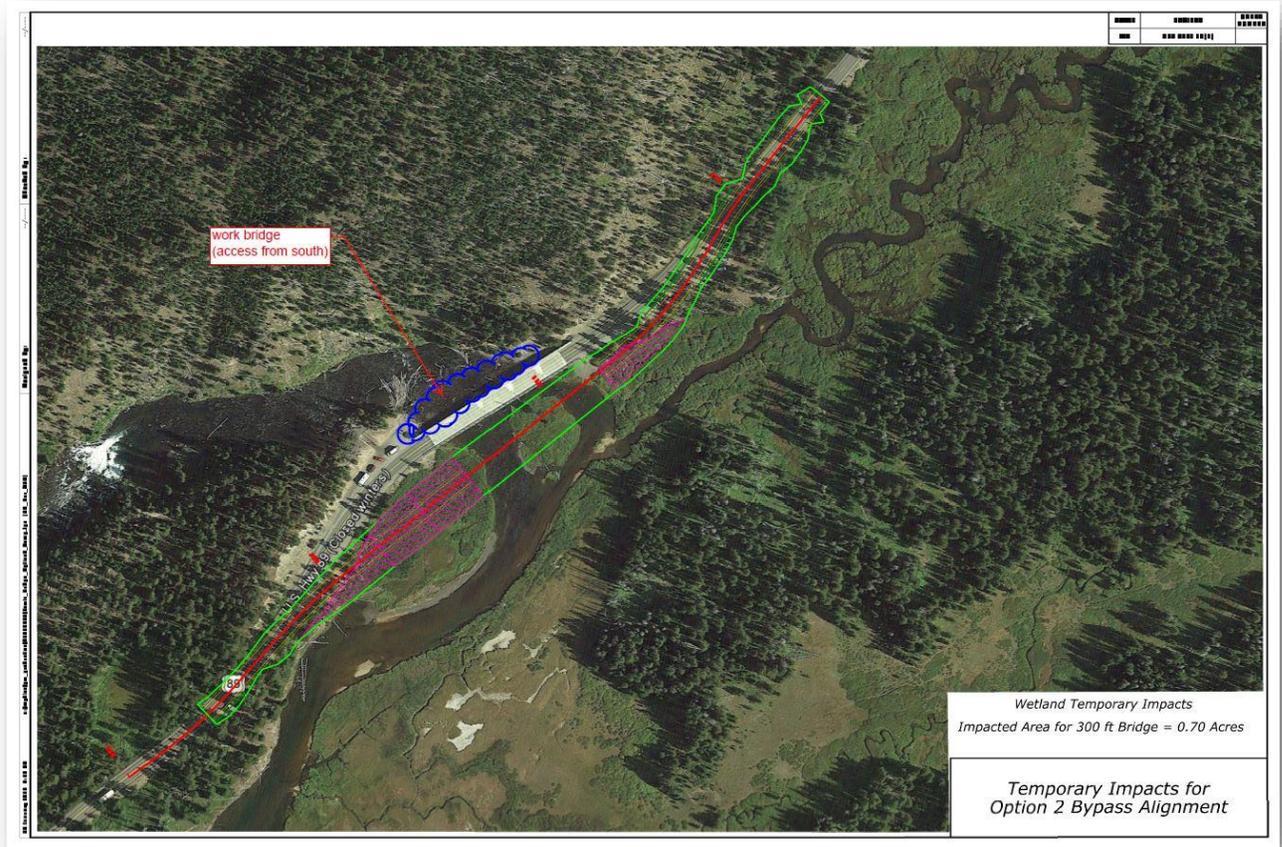


Figure 12. Replace bridge to east of current location, with work bridges west of current bridge.

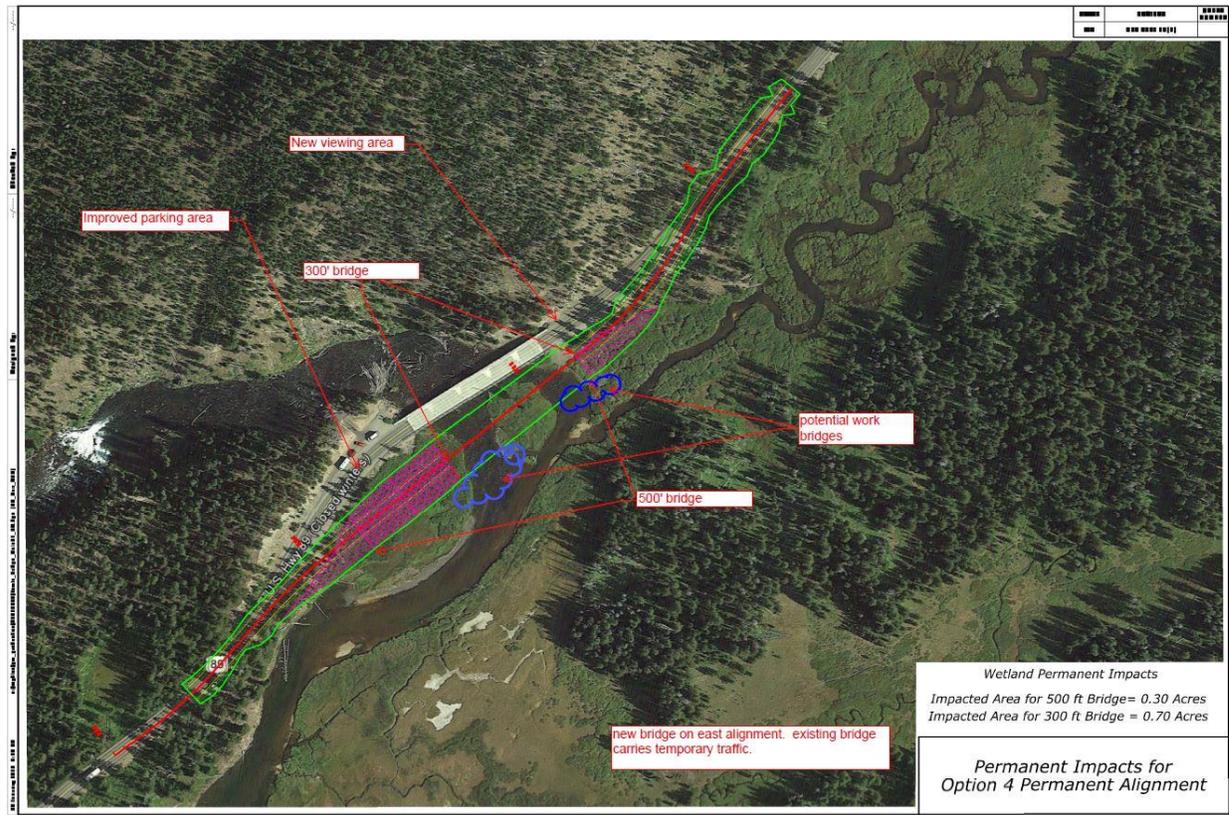


Figure 13. Replace bridge to east of current location, with work bridges east of new bridge.

Mitigation Measures

The following mitigation measures would minimize the degree and/or extent of adverse impacts and would be implemented during the project.

General Construction

- To minimize the amount of ground disturbance, staging and stockpiling areas would be located in existing parking areas, away from visitor use areas to the extent possible. All staging and stockpiling areas would be returned to pre-construction conditions following construction.
- Construction zones would be identified and where construction occurs next to vegetated areas that may be impacted, construction limits would be fenced with construction tape, snow fencing, or some 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 would be clearly stated in the construction specifications and workers would be instructed to avoid conducting activities beyond the construction zone as defined by the construction zone fencing.
- To reduce noise and emissions, construction equipment would not be permitted to idle for more than 10 minutes while not in use according to the Superintendent's Compendium, based on CFR 36 §5.13 Nuisances.
- To minimize possible petrochemical leaks from construction equipment, the contractor would regularly monitor and check construction equipment to identify and repair any leaks. Refueling and servicing equipment would be done within the turnouts and away from water bodies when feasible. Spill kits would be required at the construction site at all times.
- Construction workers and supervisors would be informed about special status species. Contract provisions would require the cessation of construction activities if a species were discovered inhabiting the project area, until park staff re-evaluates the project. This would allow modification of the contract for any protection measures determined necessary to protect the discovery.
- The NPS would ensure 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.
- To minimize the potential for impacts to park visitors, variations on construction timing may be considered. One option may include implementation of daily construction activity curfews, such as not operating construction equipment on busy holiday weekends. The NPS would determine this in consultation with the WFLHD.
- Construction workers and supervisors would be informed about the special sensitivity of park's values, regulations, and appropriate housekeeping.
- According to *NPS Management Policies (2006)*, the NPS would strive to construct facilities with sustainable designs and systems to minimize potential environmental impacts. Development would not compete with or dominate the park's features, or interfere with natural processes, such as the seasonal migration of wildlife, hydrologic activity associated with wetlands, or hydrothermal processes. To the extent possible, the design and management of facilities would emphasize environmental sensitivity in construction, use of nontoxic materials, resource conservation, recycling, and integration of visitors with natural and cultural settings. The NPS also reduces energy costs, eliminates waste, and conserves energy resources by using energy-efficient and cost-effective technology.

Air Quality

- Equipment would not be allowed to idle for excessive periods when not in use.

- All motor vehicles and equipment would have mufflers conforming to original manufacturers' specification that are in good working order and are in constant operation to prevent excessive or unusual fumes or smoke.
- All haul loads would be tarped.
- Dry conditions can cause dust to be generated by construction activities. This dust would be controlled by spraying water on the construction site, if necessary.

Soils and Geology

- If unknown conditions or problems (steam, water, heat, or voids) are encountered during the placement of bridge piers for the temporary bridge or the reconstructed bridge, the park geologist would be notified before the drilling to allow the opportunity to observe sediment layers during the process.

Vegetation

- Revegetation and recontouring of disturbed areas would take place following construction, and would be designed to minimize the visual intrusion of the structure. 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 pre-construction conditions shortly after construction activities are completed. Weed control methods would be implemented to minimize the introduction of noxious weeds. This project would follow Topsoil Retention/Vegetation Guidelines developed for previous projects within the park.
- Any equipment used would be cleaned using NPS protocols for reducing the spread of non-native species.
- Because disturbed soils are susceptible to erosion until revegetation takes place, standard erosion control measures such as the use of silt fences would be used to minimize any potential soil erosion.

Archeological, Ethnographic, and Paleontological Resources

- All contractors and subcontractors would be informed of the procedures to follow in the event of archeological, ethnographic, and paleontological resource discovery, as well as the penalties for illegally collecting artifacts or intentionally damaging paleontological materials, archeological sites, or historic properties.
- During construction, specifically activities involving earthwork or digging, qualified park staff would monitor work zones to confirm the presence or absence of significant archeological, ethnographic, or paleontological resources. Should construction unearth cultural or paleontological resources, work would be stopped in the area of discovery and the park would consult with the State Historic Preservation Office (SHPO) in accordance with §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 (1990) would be followed.

Cultural Resources

- Should construction unearth previously undiscovered cultural resources, work would be stopped in the area of any discovery and the park would consult with the state historic preservation officer and the Advisory Council on Historic Preservation, as necessary, according to §36 CFR 800.13, Post-review Discoveries and the inadvertent discovery clause in the Parks Roads Programmatic Agreement. In the unlikely event that human remains are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (1990) would be followed.

Historic Structures

- In order for this bridge and site design to be as compatible with the historic architectural characteristics on the South Entrance road segment, the design would incorporate similar architectural features such as materials, stone patterns, surface finishes, and color as those found on other structures of the road.

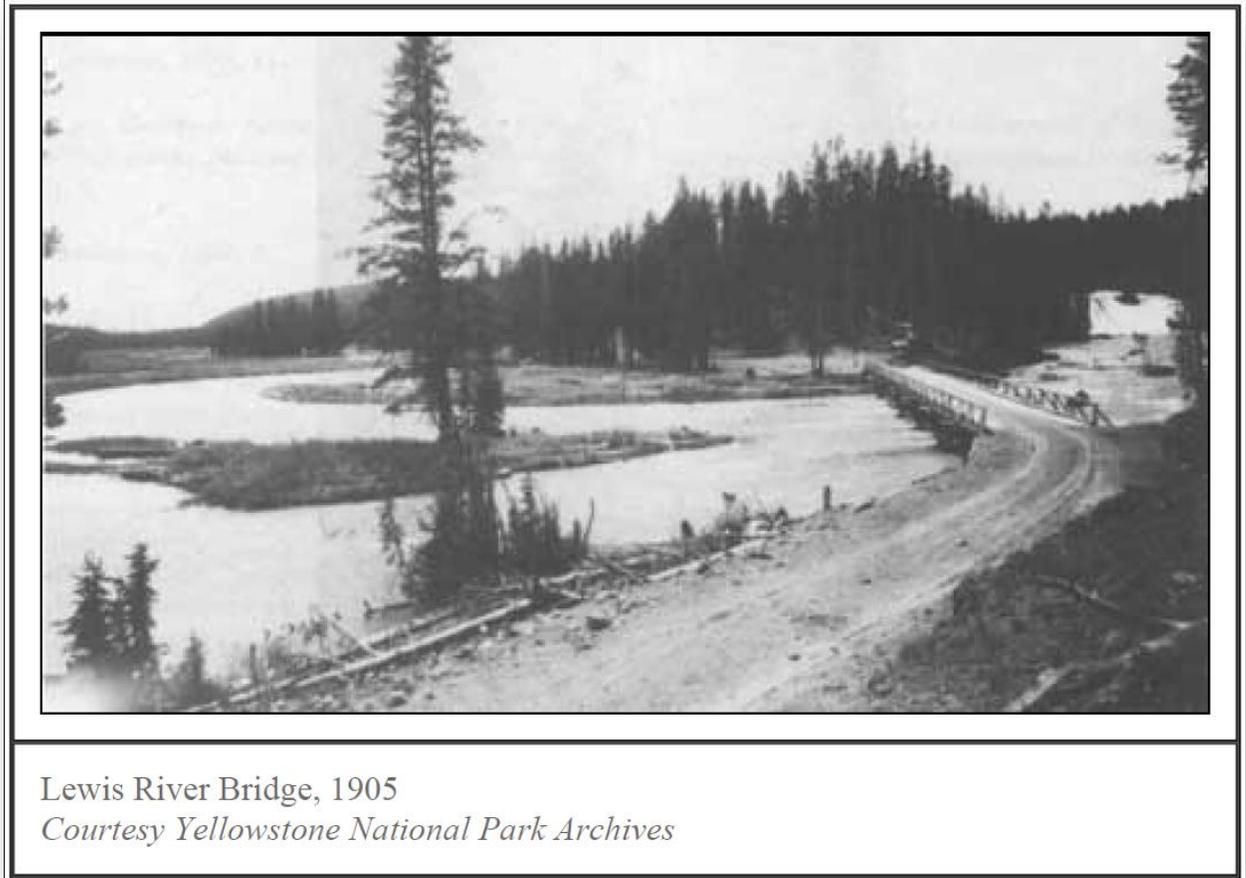


Figure 14. Historic photo of bridge.

Soundscapes

- Equipment would not be allowed to idle when not in use.
- All motor vehicles and equipment would have mufflers conforming to original manufacturers' specification that are in good working order to prevent excessive noise.

Vegetation and Soils

- Construction zones would be identified (i.e., flagging, construction tape, etc.) to confine activity to the minimum work area required.
- Construction equipment would be cleaned before entering the park to minimize the transport of exotic seeds to the site. All equipment entering the park would be inspected and may be required to be pressure washed to remove foreign soil, vegetation, and other materials that may contain non-native seeds or vegetation.
- Construction materials staging areas would be restricted to previously disturbed sites.

- Erosion control measures that provide for soil stability and prevent movement of soils would be implemented, such as installing erosion control wattles or sediment fences along the edge of construction.
- Any disturbed topsoil would be salvaged and used to restore the area.

Visitor Use and Experience

- Signs, alerts, press releases, and notifications would be issued to inform visitors of traffic delays prior to and throughout the duration of construction.
- Construction zones would be identified (i.e., flagging, construction tape, fencing, etc.) to prevent visitors from entering the construction zone unknowingly.
- Construction materials staging would be restricted to areas that would not impede vehicle traffic of visitors, contractors, or park staff.
- Traffic flow would be maintained through the construction zone over the existing bridge. Speed limit through the construction zone would be posted at 15 mph.
- Equipment would not be allowed to idle longer than 10 minutes when not in use. All haul loads would be tarped if required and no engine brakes would be used in or near developed areas and campgrounds.
- All motor vehicles and equipment would have mufflers conforming to original manufacturer specifications that are in good working order and are in constant operation to prevent excessive or unusual noise, fumes, or smoke.

Wildlife

- Construction personnel would be oriented on appropriate behavior in the presence of wildlife and proper food storage, handling, and disposal and/or other attractants.
- Ensure all project-related employees, such as contractor's employees, would be given orientation on how to avoid disturbing or encountering bears and how to minimize unavoidable effects or encounters. Orientation would include information about park regulations regarding food storage, disposal of garbage and other bear attractants, and approaching or harassing wildlife.
- The location and height of cut and fill slopes, retaining walls, and guardrails associated with the bridge project should be designed to allow wildlife that attempt to cross or travel the road to rapidly escape if threatened by on-coming vehicles.
- To avoid impacts to migratory birds during nesting season, all tree removal activities would be conducted outside of March 1-August 15 for raptors and May 1-August 1 for songbirds.
- If tree and shrub removal activities are within the March 1-August 15 window, and active nests are suspected from detection of physical structures (e.g., large collections of sticks or smaller plant material in nest-like shape, cavity holes) or behaviors (e.g., birds in and out of tree cavities, activity at nest-like structures in trees, birds carrying food into nest-like structures), bird surveys would be conducted before any tree removals.
- If any nesting birds are found, they would not be disturbed until any young have fledged the nests. Any grubbing and clearing would occur during non-nesting periods or after a survey of the area showing no active nests being located.
- Construction site and staging areas would be monitored by park natural resource staff throughout the project in case any special status species unexpectedly appear in the project area. Should any appear and if park staff become concerned about potential adverse impacts on the species from construction or other project related activities, work would stop and not resume until necessary protective steps are taken to avoid any impacts to the special status species.

Water Resources

- Storm water runoff control measures, including silt capture techniques such as silt fences would be employed to improve quality of runoff and prevent degradation of the lake and wetlands. Spill kits would be available on-site at all times.
- Design and construction measures would include development of surface water control features, such as swales, to minimize post-construction runoff.
- Improved bridge deck drainage system would improve water quality in the Lewis River by removing scuppers and draining to ends of bridge.
- Equipment would not be allowed to operate within the river. If any pumping of water is required, it would be discharged to an upland site.
- The removal of the existing bridge would require confinement techniques to prevent construction debris from entering the Lewis River.
- Construction vehicles could leak fluids into the river and wetlands. To minimize this possibility, equipment would be checked frequently to identify and repair any leaks.
- Fuel and oil services for construction machinery would be provided in a designated area away from the river and wetlands when feasible. This would include secondary containment for all fuel storage tanks and on-site availability of a spill kit.
- BMPs would be used to reduce sedimentation and turbidity for all construction activities, including pulling existing piers and abutments and in water work.
- Design would be completed in such a way as to leave the shoreline of the river in its present configuration with no change to hydraulics of the river.

AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the affected environment (existing setting or baseline conditions) and analyzes the potential environmental consequences (direct, indirect, and cumulative impacts or effects) that would occur as a result of implementing the alternatives.

Cumulative impacts are defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions” (40 CFR 1508.7). In order to determine the cumulative impacts it was necessary to examine past, present, and reasonably foreseeable future actions in Yellowstone National Park. Cumulative impacts are considered for the no action and the preferred alternative. The following projects were identified for the purpose of conducting the cumulative effects analysis:

Past Actions

- **2016 – Lewis Lake Campground Trailer Removal** – Yellowstone National Park removed a mobile home trailer that was 36 years old and had been unoccupied for seven years. Prior to that, it served as the living quarters for the Lewis Lake Ranger. The trailer was in disrepair and infested with rodents and small mammals. In order to remove the trailer, approximately 50 trees (Douglas-fir and Engelmann spruce) that were mostly under 3 inches in diameter at breast height (dbh) were cut to enable equipment access.

Present Actions

- None in progress

Foreseeable Future Actions

- **South Entrance Road Reconstruction** – The South Entrance Road is the road segment from the intersection at West Thumb heading south to the South Entrance of the park. The Lewis River Bridge is located on this road segment. The 1992 Parkwide Road Improvement Plan for Yellowstone National Park stated that much of the principal park road system would receive major reconstruction. The typical road section for these reconstructed roads would be a 30-foot paved width. This would consist of two 11-foot lanes, and two 4-foot paved shoulders. The existing South Entrance Road is approximately 22-24 feet wide. A swath along the existing road would be impacted from the removal of vegetation and changed topography directly adjacent to the roadway from modifying the cuts and fills along the road edge. Some visitor traffic would be impacted from short-term delays during construction of likely up to 30 minutes, or potential late-season closures of up to four weeks.

Wetlands

Affected Environment

A wetland survey (figure 15) of the project area (6.8 acres) was conducted in 2017. The area was revisited in July 2018 for further vegetation analysis. Wetland boundaries were determined using the 1989 U.S. Army Corps of Engineers Wetland Delineation Manual and 2010 Western Mountains, Valleys, and Coasts Regional Supplement. Eight wetlands (2.045 acres) and the Lewis River were identified within the project area boundary.

Within the Cowardin hierarchical classification (Cowardin et al. 1979), four systems were found: palustrine forested (PFO), palustrine scrub-shrub (PSS), palustrine emergent (PEM), and riverine (R). Each classification exhibited slightly different water regimes.

The one PFO depression within the study area likely receives hydrology from groundwater flow and snowmelt. The four PSS systems form a riparian buffer within the floodplain of the Lewis River, receiving water from the Lewis River and snowmelt. The two PEM systems consisted of snowmelt fed wet meadows and a small wetland island located between two branches of the Lewis River. An intermittent stream was found near the southern portion of the study area and seems to convey water from LRB001 under the road to the Lewis River.

Common species within the palustrine systems included alpine nerve sedge (*Carex neurophora*), bluejoint (*Calamagrostis canadensis*), arrowleaf ragwort (*Senecio triangularis*), American globeflower (*Trollius laxus*), mountain willow (*Salix eastwoodiae*), and Bebb willow (*Salix bebbiana*). Notably, the study area lacked significant populations of invasive plants. No unusual wetlands, such as fens, spring mounds, or thermally-influenced wetlands, were noted during the delineation field work.

No wetland ditches were observed along the roadside during the delineation field work. One upland ditch was noted as a potential location for dewatering activities during construction.

Impacts of Alternative A—No Action

Under Alternative A, no action would be taken to reconstruct the existing bridge. There would be no new wetlands impacts because the existing bridge's piers and abutments would not be replaced and a temporary work bridge would not be constructed. The current bridge would remain as is, though routine maintenance, such as stabilization activities, would continue until safety concerns force the eventual closure of the bridge. During any required maintenance of the existing bridge, protective measures would be implemented to limit impacts on wetlands in the area.

The existing bridge has four piers located in the river channel. These piers speed up water by narrowing the usable channel, which accelerates erosion and scour of the streambed. Accelerated erosion and scour would continue under the no-action alternative, causing a small adverse effect on wetland function adjacent to the bridge.

Cumulative Effects and Conclusion

Under the no-action alternative, there would be adverse impacts only in the immediate area of the bridge due to ongoing maintenance activities such as repair of spalling concrete, replacement of rails, and repaving of the deck. These activities, and the associated impacts, would typically last for a week or less. However, maintenance activities would not address the structural integrity of the bridge and would not typically extend its useful life. Scour of the streambed at this location would continue due to the existing piers within the river channel, which has a small adverse effect on wetland function in the area.

Widening of the South Entrance Road in the future has the potential to create temporary and permanent wetlands impacts in the Lewis River corridor, though specifics are difficult to determine. The South Entrance Road project would likely include activities such as widening of the road and its prism, shoulder work, and cuts and fills. These actions could result in increased turbidity and sedimentation in the Lewis River during construction, decreases in wetland function in roadside areas, and direct loss of wetlands. However, any permanent losses would be offset with restoration of degraded wetlands at other locations in the park.

Cumulative impacts to wetlands would occur mostly from proposed future widening of the South Entrance Road which would occur from direct loss by construction of roadbed over them in the few instances that they cannot be avoided. Mitigation for wetland impacts is required by NPS policy which requires restoration of already impacted wetlands to offset losses (explained further under "Impacts for Alternative B" –following). Exact area of future impacts cannot be determined without further design and survey of existing conditions, though overall would be small as

avoidance, minimization, and NPS policy limit impacts greatly. Most wetlands are located near the river corridor some distance from where construction activities would occur over much of the South Entrance Road. The no-action alternative would contribute a very small incremental adverse impact to the overall cumulative impacts to wetlands.

Impacts of Alternative B—(Proposed Action and NPS Preferred)

Under Alternative B, replacing the existing bridge would require building retaining walls, replacing the abutments, piers, deck, and rails. These activities would have permanent adverse impacts from the direct loss of existing wetlands. Replacing these components along with construction of a temporary work bridge would temporarily disturb the river shore and wetland island below the existing bridge and temporarily generate increased turbidity. Turbidity and sediment can settle on wetland vegetation until the next snowmelt event causes high water to flush built up sediment from these wetland areas. No heavy equipment would operate within the river. Equipment would be located on shore or on the existing bridge, or work bridge, for all in-water work. This work would be done in a manner that minimizes movement of river sediment and increases in turbidity. Best management practices outlined in the Mitigation Measures section would be implemented to prevent spills of fuel, concrete, or other products associated with bridge reconstruction. In order to protect the native communities within the project boundary, all equipment would be cleaned prior to its entry on site, all material would be brought in from weed-free pits, and the existing topsoil would be saved and returned to the area following construction.

The proposed Lewis River Bridge replacement would be constructed immediately east of the existing bridge. Based on the most recent designs of a 300-foot long bridge, 0.25 acres of wetlands would be permanently impacted as a result of this project. This estimate of permanent impacts is the “worst case” based upon preliminary construction designs. As the design for the bridge progresses, actual impacts may be less.

Compensatory mitigation for the 0.25 acres of permanent wetland impacts would be accomplished through the removal of 1.88 acres of road fill presently located within the lower Pelican Creek drainage system inside the park: 1,300 linear feet of causeway would be removed and replaced with a viaduct to restore wetland acreage and function.

Temporary adverse impacts to wetlands associated with reconstruction of the bridge and temporary bridge would include temporarily covering the one forested wetland (0.02 acres) identified within the project area with fill material for the temporary bridge, an increase in turbidity from installation and removal of bridge piers, and a potential increase in sedimentation from erosion during construction of the bridge abutments and regrading of the parking lot and road. The temporary work bridge and the existing bridge would be removed when reconstruction of the replacement bridge is completed. Temporary wetland impacts from construction would be rehabilitated. Thus, temporary adverse wetland impacts would last only as long as the project (e.g., April–November for two consecutive years).

Removal of the four piers in the river channel would have a permanent beneficial impact on wetlands in the project area. These piers speed up water by narrowing the usable channel, causing bank erosion and scour of the streambed. Erosion and scour increase sedimentation, which has a slight adverse impact on wetland function and hydrology in the immediate area.

Cumulative Effects and Conclusion

Widening of the South Entrance Road, has the potential to affect wetlands in the future. The types of impacts, as well as duration and scale, are the same as those described in the no-action alternative.

While future widening of the South Entrance Road would likely impact existing wetlands, the

NPS has a policy that requires no net loss of wetlands to occur on NPS lands. The policy requires any wetland impacts be mitigated through restoration of equal or greater acreage of previously disturbed wetlands of a similar type on NPS lands. Because of the mitigation requirement any new wetland impacts from this and future projects would be small, though permanent, and adverse in the Lewis River corridor. However, wetlands impacts as a result of the preferred alternative in the project area would be mitigated through restoration of degraded wetlands at other locations, resulting in no net loss of wetlands in the park. The cumulative adverse impacts to wetlands from the past present and reasonably foreseeable actions is expected to be very small because of mitigation and the incremental adverse impact of the preferred alternative would only contribute a small amount to the overall cumulative effects.

Visitor Use and Experience

Affected Environment

People from around the world come to Yellowstone each year to experience its wonders. Over the past decade, annual visitation to Yellowstone averaged approximately 3.6 million visitors. However, park visitation in each of the past three years has exceeded 4 million visitors. This trend is expected to continue into the future. Visitation is highly seasonal; June, July, and August are the months of highest use, with 50% of the park's visitors arriving in July and August. The shoulder-season months of May and September receive less use, but volume is still substantial. During the summer season, average daily traffic on the South Entrance Road is 5,730 vehicles per day (OTAK 2017). When people-per-vehicle averages are incorporated, it is likely over 13,000 people per day use the South Entrance Road during summer.

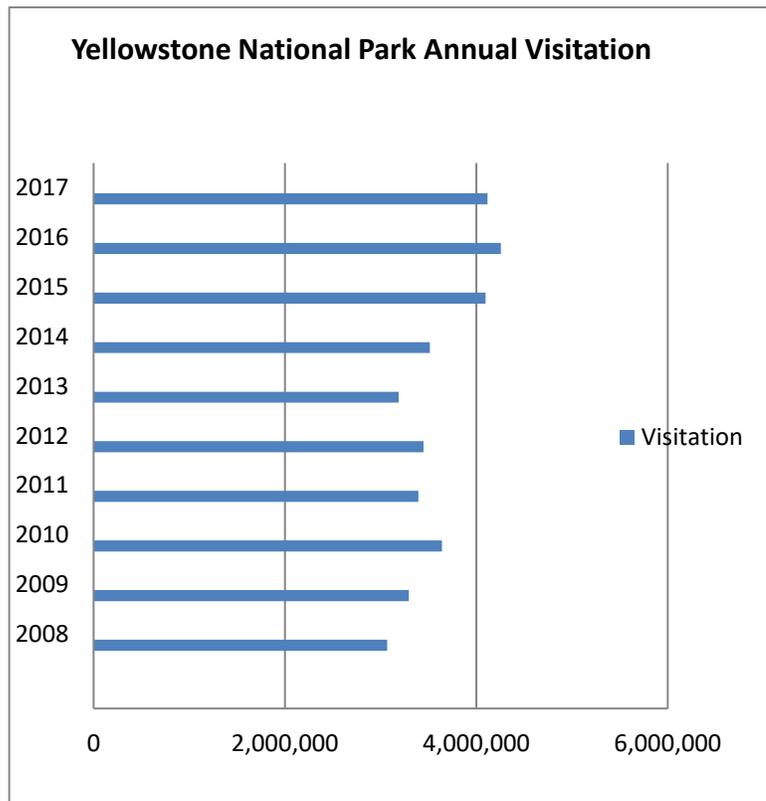


Figure 15. Park visitation for past 10 years.

The Lewis River Falls area is heavily used by park visitors due to its location adjacent to the South Entrance Road. Opportunities to view and photograph the Lewis Falls, Lewis River, Aster Creek, and wildlife are popular. For visitors with limited time, small children, or limited physical abilities, the Lewis River Falls overlook trail provides a quick, enjoyable experience.

Lewis River Falls frequently attracts large groups of visitors. Visitors often congregate on the roadway and bridge to take photographs, which heightens vehicular congestion and raises the potential for accidents and injuries.

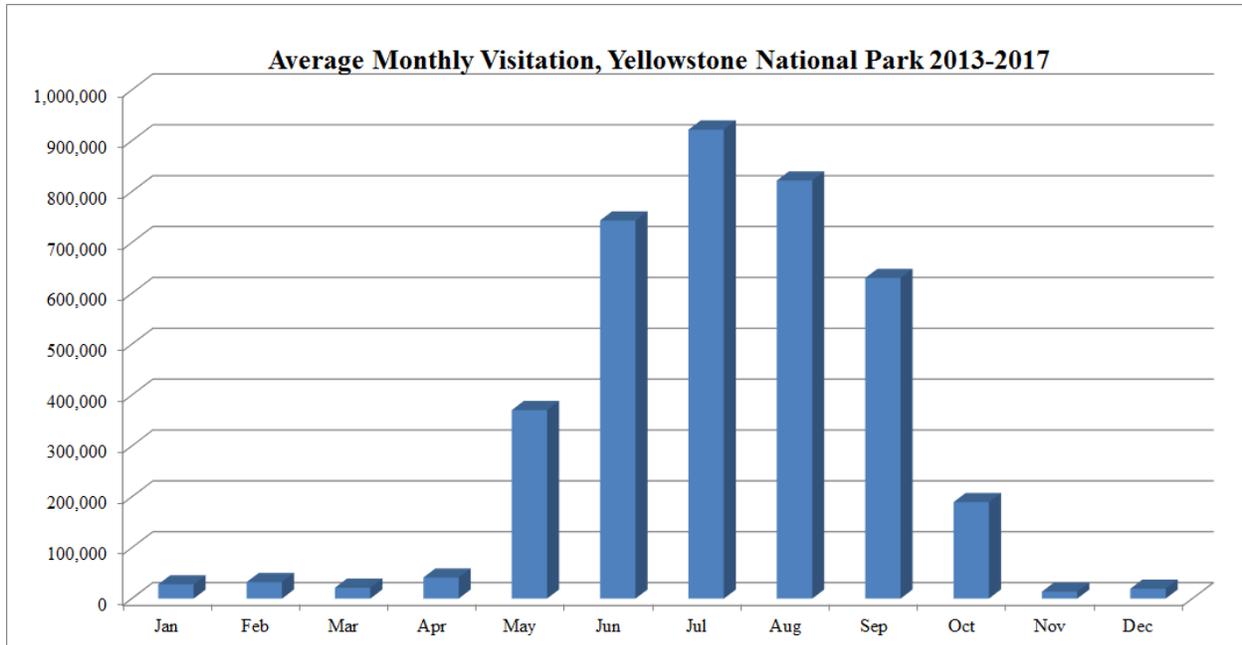


Figure 16. Average visitation.

Impacts of Alternative A—No Action

Under Alternative A, there would be no action and no new impacts on visitor use and experience in the project area. Thousands of visitors per day would continue to enjoy the Lewis River corridor, as well as views of Lewis Falls and surrounding scenery from the existing bridge, overlook, and trail. However, increasing visitation, particularly during peak season, would exacerbate congestion at the Lewis River Falls trailhead and further detract from the visitor experience over time. Visitor behaviors which pose safety risks, such as drivers making sudden turns and pedestrians congregating in the road, would continue to contribute to vehicle congestion and safety concerns around the bridge. Potential for motor vehicle-pedestrian collisions would increase with more traffic.

Under Alternative A, the Lewis River Bridge would not be reconstructed. The bridge would continue to deteriorate until it is no longer operative. Eventually, a closure would be required, though the timeframe is hard to predict accurately. A closure of the bridge would prevent visitor access into the majority of the park from the South Entrance.

Closure of this section of road could negatively impact over 13,000 visitors per day during summer by increasing travel times by a full day or more for those traveling between Yellowstone National Park and Grand Teton National Park; each day, these visitors would have to enter or exit the park through the west or east entrances, rather than the south entrance. Closure of this route would also heighten congestion along the west and east entrances by displacing South Entrance Road traffic to these entrances. At the bridge, improvements would not be made to the existing parking area or pullouts. Parking spaces would not be delineated and the asphalt parking lot and pullouts would not be resurfaced.

Cumulative Effects and Conclusion

Past, present, and reasonably foreseeable future actions that have or could impact visitor use and experience under Alternative A include periodic bridge maintenance that would help prolong an eventual complete closure of the bridge. Widening of the South Entrance Road at some point in the future would result in traffic delays of up to one hour (for several years) while this road segment is reconstructed to 30 feet in width. Equipment noise, bridge restrictions and traffic

delays during maintenance work and road widening all have the potential for small adverse impacts on the visitor experience. The impacts of a project to widen the South Entrance Road would impact to visitors from future traffic delays. The no-action alternative would eventually lead to short closures of the bridge for repair work (less than a day for any given project) and eventually the bridge may have to be closed for safety reasons, creating a permanent adverse impact on 13,000 or more visitors per day. The incremental adverse impact of the no-action alternative to the cumulative impacts to visitor experience could be, depending on the duration of the maintenance project, be substantial when occurring with other projects.

Impacts of Alternative B— (Proposed Action and NPS Preferred)

Under Alternative B, 30-minute traffic delays throughout the construction window (April–November for two consecutive years) would have a small adverse impact on visitors due to delays, noise and temporary closure of the overlook. Further, approximately six closures lasting up to six hours each may be needed over a span of two weeks to set bridge girders. These closures would be done outside of peak visitation periods, but several thousand visitors could be delayed or may choose another route during the six-hour closures. Visitors would not be able to access the trail to the Lewis River Falls or turnouts that offer views of the Lewis Falls from the South Entrance Road due to closures during construction. Construction noise would occur throughout the construction phase spanning two and a half seasons (April–November). This noise would be intermittent and would not be audible beyond a half mile from the project area.

As described previously, the parking area that serves the Lewis Falls Trail would be improved and slightly expanded. This would allow for approximately 10 more vehicles to park at this popular viewing area for Lewis Falls. The proposed parking design would help to alleviate congestion by reducing queueing and increasing the rate at which vehicles can cycle through the parking area. Parking and roadway improvements would also improve safety by better separating pedestrians and vehicles.

Over the next 50 years (lifespan of a new bridge), tens of millions of visitors would enjoy the benefits of a bridge replacement, associated parking improvements, widened pedestrian walkways, and better pedestrian/vehicle separation. The widened walkways on the new bridge would provide access to views of the river and falls for visitors with disabilities, alleviating the need to traverse a steep trail to the current overlook. The site reconfiguration would also provide visitors with added safety and comfort while reducing vehicle queueing. Communication actions such as press releases, prior to and during construction, would benefit visitors by informing them of the upcoming project and allowing them to plan accordingly.

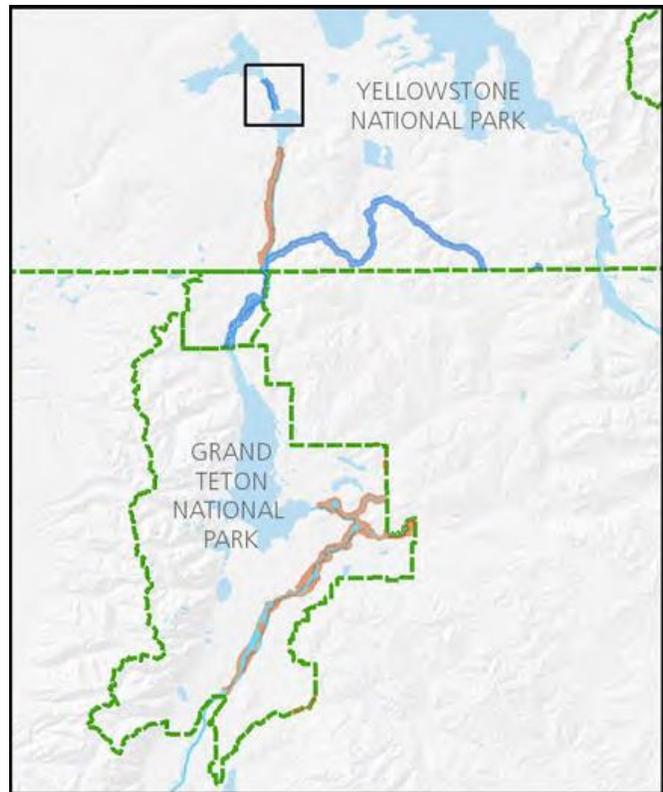


Figure 17. Lewis River, “Wild” segments in blue and “Scenic” segments in brown.

Cumulative Effects and Conclusion

Widening of the South Entrance Road would involve construction-related delays, noise, and potential closures of roadside attractions, all of which would create small adverse impacts on the visitor experience. These impacts could last for several years during construction. The bridge replacement project would include these same types of actions and adverse impacts, although the duration would be shorter: typically less than two years and limited to the project area.

The preferred alternative in this EA would increase visitor accessibility at Lewis River Bridge, improve traffic flow, and create a safe and comfortable area to view the falls, all permanent beneficial impacts. Future widening of the South Entrance Road could reduce wildlife jams on the road and improve safety.

Future construction on the South Entrance Road would cause visitor delays for travel in this section of the park. When combined with impacts to visitors from this project, including closure of the Lewis Falls Overlook and traffic delays, the incremental impact of Alternative B along with the impacts to visitors and their park experience from past, present, and reasonably foreseeable actions would be small, though adverse for the next few years. Once construction is complete, the incremental impact of Alternative B would be beneficial to the visitor experience for the foreseeable future.

Wild and Scenic Rivers

Affected Environment

On March 30, 2009, passage of the Craig Thomas Snake Headwaters Legacy Act of 2008 added 414 miles of rivers and streams of the Snake River Headwaters to the national wild and scenic rivers system. The purpose of this designation is to protect the free-flowing character, water quality, and outstandingly remarkable values for the benefit and enjoyment of present and future generations. Under the selected alternative in the *Snake River Headwater Comprehensive River Management Plan / EA* (2013), the headwaters are to be managed as a more primitive, undeveloped, natural setting with modest improvements to enhance resource conditions and visitor experience. The Lewis River, of which this bridge replacement project crosses, is part of that system. The segment of river in the project area is designated as *Scenic*.

Goals of the Comprehensive River Management Plan are: 1) promoting the natural hydrological processes and reducing impediments to free-flowing conditions; 2) protecting and enhancing the natural functions, including diversity, wetlands and floodplains; 3) protecting and enhancing cultural resources; 4) providing a diversity of opportunities and settings for visitors; and 5) establishing appropriate land uses and associated developments consistent with each river segment classification.

Description of Lewis River Scenic Segment – This segment is located south of Lewis Lake and runs to the southern boundary of Yellowstone National Park. The South Entrance Road parallels the river for approximately 12 miles. Approximately 5,730 vehicles per day travel on this route during peak season. Sixteen road turnouts and parking areas provide additional access to view the river. These points also provide river access to anglers, many of whom are fishing for brown trout which are prevalent in this segment. Boating is not allowed due to the extreme gradient and narrow canyon walls. This segment has access points for overnight trips into Yellowstone's backcountry, although no overnight use is allowed along the river.

Impacts of Alternative A—No Action

Under Alternative A, there would be no new impacts on the “*Scenic*” designation of this segment of the Lewis River. The existing bridge would remain in place, along with its four existing piers. These piers are slightly affecting the natural meandering of the river, and increasing scour of the riverbed by increasing water speed in the immediate area. These slight impediments to the river’s free-flowing condition would remain. Turbidity levels would remain as they are today, except during natural events such as storms and spring snowmelt runoff. Temperature and nutrient availability parameters would not change. Boating in this stretch of the Lewis River is not allowed and would not be altered.

Cumulative Effects and Conclusion

Future widening of the South Entrance Road would result in increased turbidity for short periods of time, typically lasting no more than a couple weeks at any given location, although a 12-mile stretch of river could be affected through the total duration of the project. Elevated turbidity levels on a large scale would be expected only during natural events such as storms and spring snowmelt runoff. Widening of the South Entrance Road would not affect the shape and depth characteristics of the river, and channel slope would not be affected. Temperature and nutrient availability parameters would not change. Boating in this stretch of the Lewis River is not allowed and would not be altered.

Overall, the no-action alternative would contribute small, adverse incremental impact to the cumulative effects on the scenic designation of the Lewis River in the project area. Overall the cumulative impacts from the Past, present, and reasonably foreseeable actions (such as road widening projects) could lead to small changes in turbidity and sedimentation near specific project locations, but impacts on the “*Scenic*” designation of the river would be negligible and temporary.

Impacts of Alternative B—(Proposed Action and NPS Preferred)

Parking and pedestrian circulation improvements would enhance activities such as photography, fishing, site-seeing, and hearing natural sounds; thus, improving visitor opportunities to appreciate the scenic qualities of this stretch of the Lewis River. The river’s edge would be more accessible to visitors by improving access through designed pedestrian routes. The removal of the existing abutments would allow access to a relatively flat stream bank on the west side of the existing bridge.

Removing the four piers in the river below the existing bridge and constructing a single pier on an island in the river, would remove a slight impediment to the river’s free-flowing condition, as well as improve natural hydrological processes in the project area. Removing scuppers on the bridge and adding a surface drainage system that does not allow bridge surface runoff into the river would improve water quality of the river. These changes would be a permanent beneficial impact, affecting the project area and the stretch of river just downstream.

The river channel at the existing bridge location is approximately 215 feet wide. The width of the active channel would not be altered. The cross-sectional shape and depth characteristics of the active channel would also not be altered. The channel slope at the bridge crossing location, which is of low gradient, would not be altered.

The planned period for in-water work is generally during low-flows in late summer and early fall. There would be a small temporary increase in turbidity due to excavation of streambed sediments for the construction of the bridge abutments and pier. Increased turbidity would slightly degrade water quality, typically for less than two weeks. Turbidity levels would return to

background levels soon after activities have been completed. Sediment retention devices (temporary sediment berms, silt fences, wattles, and flow diversion berms) would be deployed as needed to reduce river turbidity levels. Turbidity would not be at a level that would impact native fisheries, wildlife values, or recreational opportunities. Temperature and nutrient availability parameters would not be affected by construction of abutments and piers. Boating in this stretch of the Lewis River is not allowed and would not be altered by implementation of the preferred alternative.

Cumulative Effects and Conclusion

Future road widening of the South Entrance Road would have the same impacts at the same scale as those described for Alternative A. Implementation of the preferred alternative for this project would result in visitor travel delays, noise, and temporary increases in turbidity in the river near the bridge.

Collectively, implementation of the preferred alternative would result in small adverse impacts on water quality in the project area during the two-year construction period. However, removal of the four bridge piers—slight impediments to the river’s free-flowing condition—would create a permanent beneficial impact on river hydrology in the project area and slightly downstream.

This project would impact a single point on the river, and while the removal of the piers would be beneficial to the river’s hydrology, when considered in the relation of the 414 miles of length of the Wild and Scenic Snake and Lewis River sections as a whole, the incremental impacts from this project to the river would not meaningfully impact the resources for which it was designated.

COMPLIANCE REQUIREMENTS, CONSULTATION, AND COORDINATION

List of Agencies and Persons Contacted

Name	Title, Agency
Ray McPadden	Chief, Branch of Environmental Compliance, NPS (YELL)
Doug Madsen	Outdoor Recreation Planner, NPS (YELL)
Dan Rhodes	Landscape Architect, NPS (YELL)
Nancy Ward	Chief of Maintenance, NPS (YELL)
Heidi Anderson	Botanist, NPS (YELL)
Thomas James	Archeologist, NPS (YELL)
Daniel Stahler	Wildlife Biologist, NPS (YELL)
Connie Kratovil	Project Manager, FHWA
Gabriel Krumbein	Highway Designer, FHWA
Erin Chipps	Environmental Protection Specialist, FHWA
Mary Hopkins	Wyoming State Historic Preservation Officer

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

APPENDIX A

Lewis River Bridge Replacement

Section 7 Analysis and Determination, Wild & Scenic Rivers Act National Park Service, Yellowstone National Park

Introduction

The purpose of this determination is to evaluate whether the proposed improvements to replace the Lewis River Bridge (located 700 feet downstream of the Lewis River Falls Bar), reconstruct the road approaches to the bridge, and reconstruct visitor access and parking areas located adjacent to the bridge would directly and adversely affect the free-flowing condition, water quality, or the Outstandingly Remarkable Values (ORVs) for the affected segment of the Lewis River.

The authority for this determination was enacted under Section 7(a) of the Wild and Scenic Rivers Act (Public Law (PL) 90-542, as amended, 16 United States Code (USC) 1271-1278). Section 7(a) states, in part:

“no department or agency of the United States shall assist by loan, grant, license or otherwise in the construction of any water resources project that would have a direct and adverse effect on the values for which such river was established, as determined by the Secretary charged with its administration.”

The Wild and Scenic Rivers Act (Act) does not prohibit development along a river corridor; however, the Act does specify guidelines for the determination of appropriate actions within the bed and banks of a Wild and Scenic River. The key provision in the Act directs federal agencies to protect the free-flowing condition and other values of designated rivers and congressionally authorized study rivers. The Act prohibits federal agencies from assisting in the construction of any water resources or other project that would have a direct and adverse effect on a designated river or congressionally authorized study river.

Wild and Scenic River Designation

On March 30, 2009, President Barack Obama signed the Omnibus Public Land Management Act of 2009 as Public Law 111-11. Title V, subtitle A, section 5002 of the act amended the Wild and Scenic Rivers Act to add approximately 388 miles of rivers and streams of the Snake River Headwaters to the national wild and scenic rivers system. The National Park Service (NPS) and U.S Fish and Wildlife Service (USFWS) administer 111 miles of designated river segments; the remaining portions are within the adjacent Bridger-Teton National Forest. Designated river segments under the new law include the 7.7-mile segment of the Buffalo Fork of the Snake River from the upstream boundary of Grand Teton National Park (GTNP) to its confluence with the Snake River (Craig Thomas Headwaters Legacy Act of 2008 Sec. 5002 (d) (C) iii). This segment was designated as a scenic river under the act.

Snake River Headwaters Comprehensive River Management Plan

The Snake River Headwaters Comprehensive River Management Plan (CRMP) and Environmental Assessment (EA) were released to the public in May 2013. The decision, a Finding of No Significant Impact (FONSI), was signed in February 2014. The CRMP establishes the overall management direction for designated wild and scenic river segments within Grand

Teton and Yellowstone national parks, John D. Rockefeller, Jr. Memorial Parkway, and the National Elk Refuge. The plan addresses resource protection, development of lands and facilities, user capacities, and other management practices necessary to achieve desired resource conditions. Replacement of the Lewis River Bridge and improvements to the parking areas and turnouts are specifically described in the preceding Environmental Assessment (EA) under the preferred alternative (B).

Wild and Scenic Rivers Act Section 7 Determination

The National Park Service is the administering agency of the designated Wild and Scenic segments within Yellowstone National Park. Under Section 7(a) of the Act, the NPS is responsible for conducting the Section 7 analysis for this proposal and making the determination of effects under the Act. The analysis must review potential impacts to determine whether the project would have a “direct and adverse” effect on the values for which the river was designated “Wild and Scenic,” including any effects on the river’s free-flowing conditions, water quality, and the ORVs for which the river was designated.

The Section 7 evaluation for Lewis River Bridge Replacement has been summarized below. This evaluation was based on guidance provided within the Wild and Scenic Rivers Act: Section 7 Technical Report (Interagency Wild and Scenic Rivers Coordinating Council 2004), Appendix C, Evaluation Procedure Under “Direct and Adverse.”

Outstandingly Remarkable Values

Outstandingly Remarkable Values (ORVs) are the river-related values that make the river segment unique and worthy of special protection. They form the basis for the river’s designation as a Wild and Scenic River. The scenic segment of the Lewis River, which stretches from the south end of Lewis Lake to the confluence with the Snake River near the southern boundary of Yellowstone National Park, consists of the following ORVs:

Scenic Values – The dramatic Lewis Canyon is the result of two different lava flows converging near the edge of the Yellowstone Caldera to create a unique sweeping view of the edge of the plateau. A thousand feet of relief draws the eye to a continuous cascade in a narrow gorge that empties into the braided channel at the bottom. Aspens, willows, and lodgepole pines create a kaleidoscope that changes with the seasons. Lewis River Falls is an easily accessible example of the waterfalls found in the region.

Recreational Values – Lewis River Falls is a prominent feature along this segment, easily accessed by the main park road. It is popular for sightseeing and photography, while the river below is enjoyed by anglers. The Lewis River Canyon provides an awe-inspiring experience for thousands of road-bound visitors. The opportunity to view a truly wild river that is substantially free from the effects of modern human activities is a quality integral to visitor enjoyment of the river. The canyon also presents a dramatic view of erosion of the volcanic Yellowstone Plateau by the Lewis River.

Cultural Values – Regionally significant and possibly nationally significant archeological sites along this segment of the Lewis River represent 12,000 years of use as a travel route. Early trails are associated with trappers (e.g., Osborne Russell and Jim Bridger), U.S. cavalry who first administered the park, and tourists from late 19th century through today.

Ecological/Wildlife Values – This segment flows through the Lewis River Canyon—a remote, rugged, and undeveloped stretch of river that is rarely used by visitors. River characteristics and processes are unaltered and support healthy wildlife and fish populations. As a result of long-

standing limitations and visitor-use management, the canyon acts as a refugia for a diverse assemblage of species as well as important habitat connectivity with the Snake River downstream.

Fish Values – The lower reach of the Lewis River below the waterfalls contains the nationally significant Yellowstone and Snake River fine-spotted cutthroat trout.

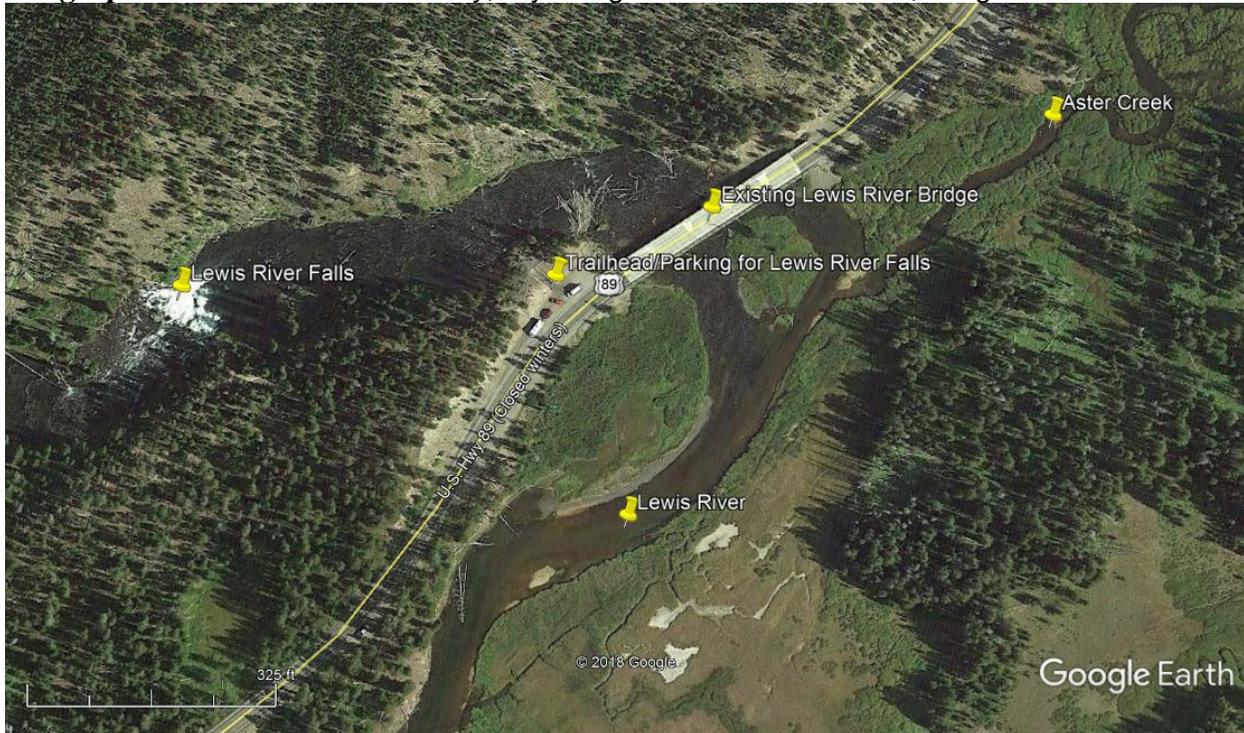
Geologic Values – This segment contains a regionally significant example of the convergence of two different volcanic tuff and lava flows, which form Lewis Canyon. Geology is considered an outstandingly remarkable value due to the presence of exemplary lava flows, volcanic tuff, and the dramatic canyon.

Outstanding Natural Resource Waters

All of the rivers and streams within the Snake River Headwaters have been designated by the U.S. Environmental Protection Agency and the State of Wyoming as outstanding natural resource waters, where no water quality degradation is allowed.

Project Proponent: National Park Service (NPS) and Western Federal Lands Highway Division (WFLHD) of the Federal Highway Administration (FHWA)

Geographic Location: Teton County, Wyoming. Latitude: 44.267703°, Longitude: -110.634199°



Project Location.

Purpose and Need for Project

The purpose of this project is to replace the Lewis River Bridge, improve safety for drivers and pedestrians, improve visitor experience, and address parking issues. The project is needed because:

- Lewis River Bridge is listed as a Priority of Improvement Category B (Major) in the latest bridge safety inspection (9/16/16). Category B means: “Structure is seriously deficient or

presents a safety hazard, but can remain in service at reduced loads or with frequent inspections.”

- Lewis River Bridge has widespread deterioration of the deck, abutments and wing walls exhibit widespread cracking delamination and spalling, and is deemed as “Scour Critical.”
- The bridge has 3-foot sidewalks, which are a sub-standard width and could be a safety hazard.
- This site is popular for viewing Lewis Falls. Available parking is in a pullout on the south side of the bridge and does not meet current visitor demand. The parking area has turning and sight distance issues and potential for vehicle-pedestrian conflicts.

Project Description

The Lewis River Bridge would be replaced on a new alignment directly east of the existing bridge. The South Entrance Road would be shifted several hundred feet on either side of the bridge to line up with the new bridge. Traffic would be carried on the existing bridge while the new bridge is under construction. Once construction is complete the existing Lewis River Bridge would be removed. A temporary work bridge would likely be constructed within the alignment of the new bridge in order to facilitate its construction. This work bridge would be removed prior to completion of the new bridge. Construction is anticipated to last two and a half construction seasons (April-November each year). The existing parking area on the southwest corner of the existing bridge would be reconfigured and expanded by approximately 10,000 square feet. The ingress, egress, and pedestrian areas associated with this parking area would also be improved by expanding turning radii for vehicles and marking parking spaces. The vehicle pullouts on the northeast and northwest of the bridge would be reconstructed in the new bridge location. The pullout located southeast of the bridge would not be retained to avoid additional encroachment on wetlands in the project area.

Duration of the Proposed Activities: The construction portion of project would begin in the summer/fall of 2020 and be completed by November of 2022.

Magnitude and Extent of the Proposed Activities: Access to the project area would occur via the existing South Entrance Road. Stockpiling of materials and staging for the bridge project would occur in previously disturbed areas within the project limits and at the Lewis Lake Pit (located directly north of Lewis Lake and west of the road) and the South Entrance Pit (located about 0.9 miles north of the south entrance). Large construction equipment would likely consist of excavators, dump trucks, cranes, and bulldozers.

Relationship to Past and Future Management Activities: The National Park Service has occasionally manipulated riverbed sediments upstream when doing bridge work in the past and would continue to manipulate these sediments on an as-needed basis in the future to maintain the bridges.

Evaluation Criteria

The position of the proposed activity relative to the streambed and streambanks: The bridge abutments would be located above the Ordinary High Water (OHW) elevation. Work would occur mostly after high spring runoff periods, and any in-water work would occur when the river is relatively low, from July through November. A single support pier would be

constructed on an island separating two channels of the Lewis River. This single pier would replace four existing piers, all of which are within the Lewis River.

Describe Whether the Proposed Activity Will Directly Alter Within-Channel Conditions

Any likely resulting changes in:

- Active channel location: The project would remove four piers that are currently within the active channel and are currently affecting the meandering of the channel.
- Channel geometry (cross-sectional shape, width, depth characteristics): A single active channel between normal high water levels at the existing bridge location is approximately 215 feet. The proposed bridge location would cross two active channels. The width of the active channels would not be altered. The cross-sectional shape and depth characteristics of the active channels would also, not be altered.
- Channel slope: The channel slope at the bridge crossing location, which is of low gradient, would be not be altered.
- Channel form (straight, meandering, or braided): The channel of the Lewis River at the project area meanders from the northeast around a curve back to the southeast. The river channel would not be altered.
- Relevant water quality parameters (turbidity, temperature, nutrient availability) -: The planned work period is generally after seasonal high flows. There would be a potential, temporary increase in turbidity due to excavation of streambed sediments for the construction of the bridge abutments and the bridge pier. Turbidity levels would return to background levels soon after activities have been completed. Sediment retention devices (temporary sediment berms, silt fences, wattles, and flow diversion berms) would be deployed as needed to reduce river turbidity levels. Temperature and nutrient availability parameters would not be affected.
- Navigation of the river: River navigation in this stretch of the Lewis River is not allowed and would not be altered. Work in the river channel would occur in the low water periods of summer and fall.

Describe Whether the Proposed Activity Will Directly Alter Riparian and Floodplain Conditions

- Position of the project relative to riparian area and floodplain: The project would occur in the river channel and within the riparian and floodplain areas outside of the river channel.
- Vegetation composition, age structure, quantity, or vigor: The project would directly and permanently alter approximately 2.04 acres of upland vegetation and 0.25 acre of palustrine wetland/riparian area along the riverbank where the bridge would be located. Vegetation along the roadway would be removed to allow for the placement of the bridge and shifted roadway. The old alignment would be restored to natural conditions by adding topsoil, reseeding, and replanting native vegetation.

- Relevant soil properties such as compaction or percent bare ground: Soil compaction could occur from heavy equipment on site. If areas are significantly compacted, decompaction would be required as part of the project mitigations. To avoid soil compaction outside of the immediate project area, staging would occur on previously disturbed ground within or adjacent to existing parking areas and pullouts.
- Relevant floodplain properties such as width, roughness, bank stability, or susceptibility to erosion: The width of the floodplain would not change. Mitigation measures would be in place to ensure bank stability and erosion would not occur during the project and after project completion.

Describe Whether the Proposed Activity Will Directly Alter Upland Conditions

Position of the project relative to the uplands: Approximately 2.04 acres of upland vegetation would be removed in order to enlarge the existing Lewis River Falls parking area. This parking area is located at the southwest corner of the existing bridge.

Any likely resulting changes in:

- Vegetation composition, age structure, quantity, or vigor: Changes in upland vegetation composition within and adjacent to the project areas are not anticipated since invasive species management efforts would be implemented as one of the mitigation measures.
- Relevant soil properties such as compaction or percent bare ground: An increase of approximately 10,000 square feet of additional asphalt would be created due to increase in size of the Lewis River Falls parking area.

Potential changes in upland conditions that would influence archeological, cultural, or other identified significant resource values: None.

Evaluate and Describe Whether Changes in On-Site Conditions Can or Will Alter Existing Hydrologic or Biologic Processes

- The ability of the channel to change course, re-occupy former segments, or inundate its floodplain: The project would not change the course of the river channel, force it to re-occupy former channel segments, or inundate the channel's floodplain.
- Streambank erosion potential, sediment routing and deposition, or debris loading: With proper erosion control and revegetation techniques, the project would not increase streambank erosion potential. Construction of the concrete abutments and bridge pier ramp would require disturbance and removal of some vegetation and soils, which could cause slight sediment loading for a short period in the immediate area of the bridge. No natural materials will be removed from the river, though the existing bridge would be removed. The project would not cause debris loading in the river channel or floodplain.
- The amount or timing of flow in the channel: Implementation of this project would not change the amount or timing of flow in the channel.
- Existing flow patterns: Natural flow patterns would not be altered.

- Surface and subsurface flow characteristics: Surface and subsurface flow characteristics would not be altered.
- Flood storage (detention storage): No effects are anticipated as the result of project implementation.
- Aggregation and/or degradation of the channel: No effects are anticipated as the result of project implementation.

Biological processes such as:

- Reproduction, vigor, growth, and/or succession of streamside vegetation: Less than a 0.5 acre of streamside vegetation may be impacted by the project. Soil conservation and revegetation activities would take place within all riparian areas directly impacted.
- Nutrient cycling: There are no anticipated changes anticipated in nutrient cycling.
- Fish spawning and/or rearing success: There are no anticipated changes expected with fish spawning and/or rearing success from the project.
- Riparian-dependent avian species needs: The proposed project would not affect riparian-dependent avian species or their habitat. Project activities would be implemented generally in summer and fall months and should not affect the nesting activities of riparian-dependent avian species. A nesting bird survey would occur prior to any construction activities, and if active nests are found they would be avoided or start times for work in the area would be adjusted.
- Amphibian/mollusk needs: No changes to amphibian or mollusk needs would occur.
- Species composition (diversity): No changes to species composition would be expected to occur.

Estimate the Magnitude and Spatial Extent of Potential Off-Site Changes

Consider and document:

- Changes that influence other parts of the river system: The proposed project would not influence other parts of the river system.
- The range of circumstances under which off-site changes might occur (for example, as may be related to flow frequency): None are known.
- The likelihood that predicted changes will be realized: N/A.
- Specify processes involved, such as water and sediment, and the movement of nutrients: N/A

Effects of the Project on Free Flowing Condition and Water Quality

Temporary increases in turbidity would occur downstream but would diminish after a short time. Removal of the four piers below the existing bridge would slightly improve the free-flowing

condition of the river. In-water work may lead to increased turbidity, and decreased water quality, in the project area for very short periods of time. However, the project would have no lasting effects on water quality. Riparian structure and function would be essentially unchanged and remain in compliance with the intent of the Wild and Scenic Rivers Act.

Effects of the Project on Outstandingly Remarkable Values

Scenic Values – The Lewis River Bridge and associated pullouts and parking areas would be designed and constructed to ensure scenic views in the area are preserved. Access to views of Lewis River Falls would be enhanced. Construction materials for stone facing, log curbs, and bridge rails, would be selected to blend in with the surrounding landscape. Overall, the project would have no direct and adverse effect to the outstandingly remarkable scenic values of the Lewis River.

Recreational Values – The enhanced parking area, walkways on each side of the proposed bridge, and curb cuts for accessibility would improve recreational access and visitor experience beside the river. Vehicle circulation would also be improved around the bridge. Construction activities would likely cause six delays or closures for visitor traffic, each lasting up to six hours. These closures would be needed during a two-week period. Any closures would be timed when visitor use is relatively low. Although there likely would be some temporary, negative effects to visitors during construction, the overall result of the project would have no direct and adverse effect to the outstandingly remarkable recreational values of the Lewis River.

Cultural Values – The bridge itself is not considered to be eligible for inclusion on the National Register. The current structure is a steel continuous stringer type bridge with a concrete cast in place deck completed in 1960. A program comment from the Advisory Council (Program Comment issued for streamlining Section 106 review for undertakings affecting post-1945 concrete and steel bridges. Federal Register Vol. 77, No. 222, Pg. 68791) indicates bridges of this design and vintage are generally ineligible for inclusion on the National Register, unless located within an historic district.

The Lewis River Bridge is located within the South Entrance Road historic district (48YE823), however the bridge is considered non-contributing to the district. In *A Context for Common Historic Bridge Types*, this type of bridge is considered to be of low significance. In *The History of the Construction of the Road System in Yellowstone National Park, 1872-1966* (1994), Mary Shivers Culpin considers the bridge to be ineligible for inclusion on the National Register. The 1993 *Programmatic Agreement Among National Park Service, the Advisory Council on Historic Preservation, the Wyoming State Historic Preservation Officer, the Montana State Historic Preservation Officer for Principle Park Road System Improvement, Yellowstone National Park* stipulates Historic American Building Record documentation be completed prior to demolition of historic bridges that are determined to be contributing structures to the overall eligibility of the road system as a mitigation measure (§IV.a.). Though the bridge is not a National Register eligible structure in and of itself, nor is it a contributing element of any other Historic District, this documentation already exists to meet any mitigation of impacts to historic properties that may arise.

An archaeological survey of the Lewis River Bridge was conducted by the University of Montana in August and September of 2017. During the course of this survey, two isolated finds were located approximately 1,500 meters north-northeast of the proposed project area. One previously recorded site (48YE2216) is located approximately 250 meters upstream from the proposed work area. None of these sites would be impacted by the proposed project. With the implementation of mitigation measures to protect undiscovered cultural resources, the NPS has

determined there would be no direct and adverse effect to the outstandingly remarkable cultural values as a result of the project.

Ecological/Wildlife Values – The ecological and wildlife values of the scenic segment of the Lewis River are a diverse assemblage of species. The canyon downstream of the bridge acts as a refugia, as well as important habitat connectivity with the Snake River to the south. Parking lot expansion and shifting the road and bridge to the east would likely result in some localized impacts on vegetation and wildlife due to vegetation removal; wildlife disturbance from noise and human presence, especially during construction activities; and limited habitat removal. As required under Section 7 of the Endangered Species Act, the NPS evaluated the potential impacts of implementation of the Snake River Headwaters Comprehensive River Management Plan on listed species. The U.S. Fish and Wildlife Service concurred with “may effect, not likely to adversely affect” determinations for grizzly bear and Canada lynx (threatened), greater sage-grouse (candidate), and North American wolverine (proposed at the time consultation was completed on August 1, 2013 as part of the Snake River Headwaters Comprehensive Management Plan). An evaluation of potential impacts to these species as a result of implementing the proposal was completed by a park biologist. Currently, Canada lynx (*Lynx canadensis*) and its designated critical habitat are the only ESA listed species for Yellowstone. The proposed action area for the Lewis River Bridge project lies outside designated Critical Lynx Habitat and there is no known lynx occupation there, therefore the proposed project would have no effect on this species. The project area also lies outside any normally utilized gray wolf (*Canis lupus*) pack territory or habitat regularly frequented by recently delisted grizzly bears. Direct and indirect effects of the proposed project would be negligible on wildlife species in general.

The U.S. Fish and Wildlife Service does not provide concurrence on “no effect” determinations. A “no effect” determination was made for Canada lynx because none are known to occupy the project area.

The bridge replacement and parking expansion and access improvements, and parking efficiencies and restoration of previous roadside parking areas would all result in lasting beneficial effects due to decreasing the amount of vegetation trampling and subsequent erosion from inefficient and improper parking.

Best Management Practices and mitigation measures would be implemented to avoid or minimize disturbance to these resources. For a list of all of these measures, see the Mitigation Measures section of the EA.

With the implementation of Best Management Practices and mitigation measures, the NPS has determined that there would be no direct and adverse effect to the outstandingly remarkable ecological or wildlife values of the Lewis River as a result of the project.

Fish Values – This segment of the Lewis River downstream of the bridge contains primarily non-native brown trout which are fall spawners. Although the brown trout are exotic, this area is a very popular fishery for them, and many anglers come to the Lewis River in late summer and fall. There would be no direct impacts on fish species in this river segment. Any changes in turbidity and water quality due to construction activity would be temporary and limited to the project area/immediately downstream. Thus, the NPS finds there would be no direct and adverse effect to the outstandingly remarkable fish values as a result of the project.

Geologic Values – The hydrologic and geomorphic conditions of the Lewis River near the Lewis

River Falls Bar are reasonably stable. The bridge is on a bend. However, the location is relatively stable due to the high, slowly eroding bluff on the north side of the river. The project would not alter this bluff. Thus, the NPS has determined there would be no direct and adverse effect to the outstandingly remarkable geologic values of the Lewis River as a result of the project.

Duration

Effects would occur during construction activities, anticipated to begin in the spring of 2020 and conclude by November of 2022.

Section 7 Determination

Based on the analysis in this report, the NPS finds the Lewis River Bridge Replacement Project would have no effect on the river’s free-flowing condition.

Water quality would not be affected except for a very short times during construction of the new bridge. Work would be done when water levels are relatively low to reduce the potential for sedimentation and turbidity. Best Management Practices would be used during the project to reduce any turbidity and sedimentation.

The NPS finds that the proposed work would have no direct and adverse effect to the outstandingly remarkable values of the scenic segment of the Lewis River.

The project is consistent with provisions of the Wild and Scenic Rivers Act, NPS Management Policies 2006, NPS Director’s Order 46: Wild and Scenic Rivers, and the Snake River Headwaters Comprehensive Management Plan / Environmental Assessment.

Based on the information contained in the statutory compliance file and in this Wild & Scenic River Act, Section 7 analysis for the subject project is complete. If the project involves hot topics or sensitive issues, I have briefed the deputy or regional director.

Recommended:

_____ Date
Park Wild & Scenic Rivers Coordinator

Approved:

_____ Date
Superintendent