



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

# Isa Lake Bridge Reconstruction Environmental Assessment

March, 2013





# Isa Lake Bridge Reconstruction

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## Environmental Assessment

### Summary

Yellowstone National Park proposes to reconstruct Isa Lake Bridge in its existing location at Craig Pass on the Continental Divide, serving the road connecting West Thumb and Old Faithful. The bridge was built in 1942 and has several structural flaws that cause severe deflection (movement) when used by heavy vehicles or loads. A 2010 bridge inspection report, prepared by the Federal Highway Administration (FHWA), determined the existing bridge is in poor condition and recommended replacement.

This environmental assessment (EA) evaluates two alternatives: a no action alternative and an action alternative. Under Alternative A, the no action alternative, Isa Lake Bridge would not be reconstructed. Issues related to the deterioration of the existing bridge would not be addressed. Under Alternative B, the action alternative, the existing Isa Lake Bridge would be removed and a bridge of similar appearance on the existing alignment would be reconstructed. During bridge reconstruction, the road would remain open via a temporary bridge spanning Isa Lake to the north of the existing bridge. Additionally, the existing parking area and pullouts would be repaired, one accessible parking space delineated, new curb logs installed, the existing kiosk structure rehabilitated, and safety concerns addressed. Reconstruction of the Isa Lake Bridge would be funded through the Federal Lands Highway Program.

This environmental assessment has been prepared in compliance with the National Environmental Policy Act (NEPA) to provide the decision-making framework that 1) analyzes a reasonable range of alternatives to meet objectives of the proposal, 2) evaluates potential issues and impacts to Yellowstone National Park resources and values, and 3) identifies mitigation measures to lessen the degree or extent of these impacts. Resource topics included in this document because the resultant impacts may be greater-than-minor include water resources and wetlands; geology and soils; vegetation including rare plants; historic structures; park operations and visitor use and experience. All other resource topics were dismissed because the project would result in negligible or minor effects to those resources. No major effects are anticipated as a result of this project. Public scoping was conducted to assist with the development of this document, of the six comments received most were in support of the project and no substantive comments were submitted.

### Public Comment

The public comment period for this EA will be 30 days. If you wish to comment on the EA, you may post comments online at <http://parkplanning.nps.gov/isa> or mail or hand-deliver comments to: Compliance, Isa Lake Bridge Reconstruction Environmental Assessment, National Park Service, P.O. Box 168, Yellowstone National Park, Wyoming 82190.

Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment – including your personal identifying information – may be made publicly available at any time. Although you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so. Comments will not be accepted by fax, email, or in any other way than those specified above. Bulk comments in any format (hard copy or electronic) submitted on behalf of others will not be accepted.

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# PURPOSE AND NEED

## Introduction

Yellowstone National Park (YNP) is located primarily in the northwest portion of Wyoming, with segments extending into southwest Montana and southeast Idaho. The park was established by an act of Congress on March 1, 1872 and is managed by the National Park Service (NPS). The 2.2 million acres of the park were “set apart as a public park or pleasuring-ground for the benefit and enjoyment of the people...and to...provide for the preservation, from injury or spoliation, of all timber, mineral deposits, natural curiosities, or wonders within said park, and their retention in their natural condition.”

The purpose of this EA is to evaluate the environmental impacts associated with Alternative A, (no action) and Alternative B (action alternative). Under Alternative A, there would be no change from existing conditions. Under Alternative B, the existing bridge would be removed and reconstructed with a bridge of similar appearance on the existing alignment.

This EA was prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, regulations of the Council on Environmental Quality (CEQ) (40 CFR §1508.9), and the National Park Service Director’s Order (DO)-12 (*Conservation Planning, Environmental Impact Analysis, and Decision-Making*).

## Background

Isa Lake Bridge is located on the Grand Loop Road in YNP at Craig Pass and has an interesting background regarding the design and original construction. The bridge that crosses over Isa Lake today is the third crossing constructed over the lake. The first crossing was constructed before 1904 and consisted of an earthen berm on the wagon road. The earthen berm divided the lake into two bodies of water, one draining into the Atlantic Ocean, the other draining into the Pacific Ocean. The second crossing was a culvert. The third, completed in 1942, is the bridge that exists today and was a topic of great discussion between the NPS and Bureau of Public Roads prior to its construction. The discussion between the two parties was related to the road alignment at Isa Lake and the architectural details of the proposed bridge. The NPS opposed use of a culvert to suffice drainage purposes and requested construction of a low timber bridge “to preserve the natural existing conditions as near as possible”. The decision to construct the bridge was accepted but several years passed before details were finalized and construction took place (Culpin 1994).

In 1988, the bridge required extensive surface repair on the deck due to cracking. A metal plate was placed over the damaged deck area and the deck paved. In 2001, the bridge and approaches were resurfaced. In 2006, a FHWA report recommended replacement of the Isa Lake Bridge within five years due to numerous structural flaws that cause severe deflection when used by heavy loads. A further evaluation in September 2008, by Western Federal Lands Highway Division (WFLHD) Engineers, determined that the timber bridge support piles and timber cap log (bent 7) were in critical condition and that repairs needed to be made. These temporary repairs were completed before the bridge opened to public traffic in spring of 2009. A September 2010, FHWA bridge inspection report determined the bridge to be in poor condition, and recommended replacement. Their evaluation also predicted that even with prior repairs completed, the bridge would be capable of service for only another five years. Due to the wood materials, moist environment, and increased traffic and weight over the structure, extensive repairs and reconstruction are needed. The bridge has been recorded to the Historic American Engineering Record standards and is listed as WY-31 (HAER 2003).



## Purpose and Need

The purpose of this project is to preserve the existing vehicular access route along the Grand Loop Road over Craig Pass in YNP (Figure 2) by maintaining a safe crossing over Isa Lake while ensuring park resources are protected. Isa Lake Bridge provides access for most visitors traveling between Old Faithful and the east side of the park, or continuing south to Grand Teton National Park.

Based on the existing condition described above, this project is needed to meet current FHWA bridge design and construction standards by having in place a bridge that would accomplish the following objectives:

1. Improve the bridge to meet the current bridge design standards.
2. Increase the vehicular load capacity for the bridge.
3. Improve safety of the bridge and adjacent parking and pullout areas.
4. Maintain visitor access on this section of the Grand Loop Road into the future.
5. Preserve the historic integrity of the Grand Loop Road and the visual historic integrity of the Isa Lake Bridge.

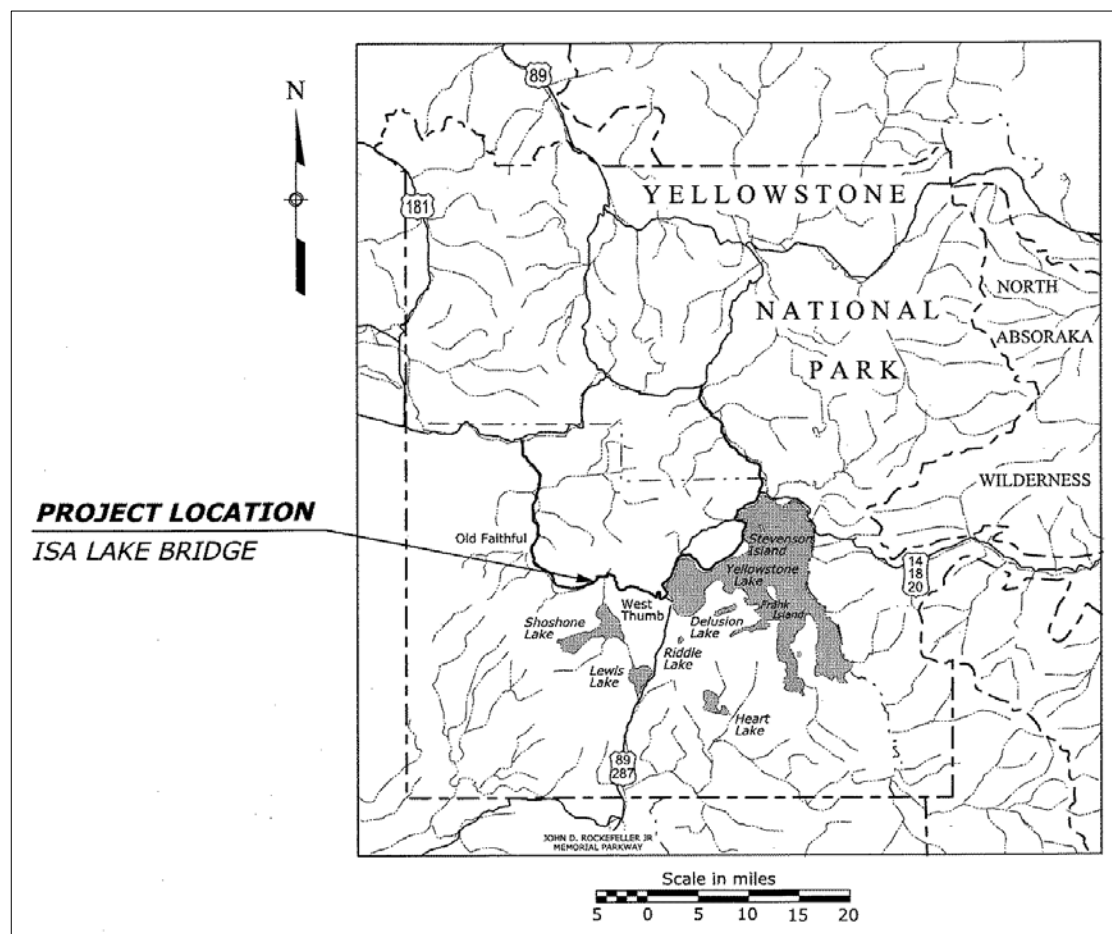


Figure 1- Project Location



## Relationship to Other Plans and Policies

**Yellowstone National Park Master Plan (NPS 1974)**—This plan discusses the park road system evolving from the railroad-stagecoach era to roads constructed by the army, and recognized that the park's road system is now overburdened due to the phenomenal growth of automobile travel, for which it was never designed. This plan strives to strike a balance between human impacts and park resources by developing management objectives for general management, resource management, visitor use and interpretation.

**Parkwide Road Improvement Plan EA (NPS 1992)** — This plan calls for a long-term program of road improvement consisting of a combination of major reconstruction projects, resurfacing, restoration, and rehabilitation projects needed to preserve and extend the service life of principal park roads, and to enhance their safety. The Isa Lake Bridge replacement project would be consistent with the intent of this plan.

**NPS Management Policies 2006 (NPS 2006)** —Management decisions regarding transportation facilities require a full, interdisciplinary consideration of alternatives and a full understanding of their consequences. The Service must find transportation solutions that will preserve the natural and cultural resources in its care while providing a high-quality visitor experience.

## Scoping

Scoping is a process to identify the resources that may be affected by a project proposal, and to explore possible alternative ways of achieving the proposal while minimizing adverse impacts. Yellowstone National Park conducted internal scoping with appropriate National Park Service staff, as described in more detail in the *Consultation and Coordination* chapter. The park also conducted external scoping with the public and interested/affected groups and Native American consultation.

External scoping was initiated with the distribution of a scoping letter to inform the public of the proposal to reconstruct Isa Lake Bridge and to generate input on the preparation of this environmental assessment. The scoping letter dated July 24, 2012 was mailed to individuals and organizations on the park's EA mailing list, including various federal, state, local agencies, and affiliated Native American tribes. Scoping information was also posted on the NPS Planning, Environment, and Public Comment (PEPC) website.

During the 30-day scoping period, a total of 6 responses were received. The majority of respondents were in support of the bridge reconstruction. There were no substantive oppositional comments. In addition, during tribal consultation, no Native American tribes responded with objection to the proposed project. More information regarding external scoping and Native American consultation can be found in *Comments and Coordination*.

## Impact Topics Retained For Further Analysis

Impact topics for this project were developed to allow comparison of the environmental consequences of the alternatives. Impact topics were identified based on federal laws, regulations, and executive orders; NPS *Management Policies 2006*; and knowledge of resources at YNP. Impact topics that were carried forward for further analysis in this EA include:

- Geology and Soils
- Water Resources and Wetlands
- Vegetation including Rare Plants

- Historic Structures
- Visitor Use and Experience

## Impact Topics Dismissed From Further Analysis

In this section, the NPS evaluates all potential impacts by considering the direct, indirect, and cumulative effects of the proposed action on the environment, along with connected and cumulative actions. Impacts are described in terms of context and duration. The context or extent of the impact is described as localized or widespread. The duration of impacts is described as short-term, ranging from days to three years in duration, or long-term, extending up to 20 years or longer. The intensity and type of impact is described as negligible, minor, moderate, or major, and as beneficial or adverse. The NPS equates “major” effects as “significant” effects. The identification of “major” effects would trigger the need for an EIS. Where the intensity of an impact could be described quantitatively, the numerical data is presented; however, most impact analyses are qualitative and use best professional judgment in making the assessment.

The NPS defines “measurable” impacts as moderate or greater effects. It equates “no measurable effects” as minor or less effects. “No measurable effect” is used by NPS in determining if a categorical exclusion applies or if impact topics may be dismissed from further evaluation in an EA or EIS. The use of “no measurable effects” in this EA pertains to whether NPS dismisses an impact topic from further detailed evaluation in the EA. The reason NPS uses “no measurable effects” to determine whether impact topics are dismissed from further evaluation is to concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail in accordance with CEQ regulations at 1500.1(b).

In this section of the EA, NPS provides a limited evaluation and explanation as to why some impact topics are not evaluated in more detail. Impact topics are dismissed from further evaluation in this EA if:

- they do not exist in the analysis area, or
- they would not be affected by the proposal, or the likelihood of impacts are not reasonably expected, or
- through the application of mitigation measures, there would be minor or less effects (i.e. no measurable effects) from the proposal, and there is little controversy on the subject or reasons to otherwise include the topic.

Due to there being no effect or no measurable effects, there would either be no contribution towards cumulative effects or the contribution would be low. For each issue or topic presented below, if the resource is found in the analysis area or the issue is applicable to the proposal, then a limited analysis of direct and indirect, and cumulative effects is presented.

### Floodplains

Executive Order 11988 *Floodplain Management* requires all federal agencies to avoid construction within the 100-year floodplain unless no other practicable alternative exists. The *NPS Management Policies 2006* and Director's Order 77-2 *Floodplain Management* will strive to preserve floodplain values and minimize hazardous floodplain conditions. According to Director's Order 77-2 *Floodplain Management*, certain construction within a 100-year floodplain requires preparation of a statement of findings for floodplains. The project area for the proposed new bridge and temporary bridge is not within a 100-year floodplain; therefore, a statement of findings for floodplains will not be prepared. Because there are no floodplains in the project

area, this topic has been dismissed from further analysis.

## **Wildlife**

The NPS is responsible for maintaining native wildlife as an integral component of natural ecosystems. Human activity and noise would increase during construction, which may disturb wildlife. Some small and large animals may be displaced during construction activities. Small mammals could be harmed and their habitat altered during ground disturbing activities for the temporary bridge. Impacts to fish would not occur as Isa Lake is absent of fish. Under the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703), it is illegal to “take” migratory birds, their eggs, feathers, or nests. In order to avoid violations of the MBTA, bird habitat would be surveyed prior to clearing activities during the nesting season, May 15 - August 1 and occupied habitat would not be removed during the nesting season. If an active nest were encountered at any time, it would be protected from removal. Construction related activities and noise would be temporary and pre-construction sound conditions would resume following reconstruction of the bridge. Impacts to wildlife would be short-term, negligible to minor, and are dismissed from further analysis.

## **Special Status Wildlife Species & Yellowstone Species of Management Concern**

The species mentioned below are either federally listed as endangered, threatened, or candidate species or are listed by the park as a species of management concern. Only species that exist or have the potential to exist in the project area are discussed.

The grizzly bear and Canada lynx are protected pursuant to the Endangered Species Act (ESA) of 1973, as amended, and are present within the potential project area. Grizzly bears have been observed in the vicinity of Isa Lake Bridge and may travel through the area. Grizzly bears travelling through the area could be temporarily disturbed or displaced by human activity and noise associated with reconstruction of Isa Lake Bridge. However, because of lack of high quality habitat near Isa Lake Bridge, grizzlies generally are absent from the area (Gunther pers. comm.). All contractor employees would be required to attend and abide by the park’s grizzly bear orientation sessions. These sessions focus on proper food and garbage storage, how to avoid disturbing or encountering bears, and how to minimize unavoidable effects or encounters. 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. Reconstruction of the bridge would be within the existing alignment and the temporary bridge removed after the project is completed. Therefore, no loss of key grizzly bear habitat would occur. By providing grizzly bear orientation sessions for construction workers and strictly enforcing management regulations, the potential effects on grizzly bears would be considered negligible.

The Parkwide Road Biological Assessment submitted to U.S. Fish and Wildlife Service (USFWS) in 2008 and the subsequent Biological Opinion prepared by the USFWS in 2009 for the Yellowstone Park Roads Program, meets the Section 7 requirements of the ESA for this project. Isa Lake Bridge project is included as part of a Parkwide Roads Program for which Section 7 compliance is complete, thus, the topic of threatened and endangered species has been dismissed from further analysis. The two alternatives described in this EA “may affect but would not adversely affect” grizzly bear. No critical habitat for lynx occurs in the project area and would therefore cause a “no effect” per Section 7 of the ESA.

The Strategic Plan for Yellowstone (NPS 2005) was written to fulfill the requirements of the Government Performance and Results Act of 1993. This Act ensures that daily actions and expenditure of resources are guided by long-and short-term goals set in pursuit of accomplishing an organizations’ primary mission, followed by performance measurement and

evaluation. Part of the Strategic Plan includes goals set for preserving native species of special concern. These are animal and plant species that scientific evidence indicates need protection, restoration, and/or conservation within a National Park because they are declining or have exceptionally limited distribution. Species of management concern would be negligibly impacted by the proposed project; therefore it has been dismissed from further analysis.

Whitebark pine, a Yellowstone species of management concern is a major component of the forest community in areas above 8,400 feet and a major understory component of lodgepole-dominated forests from 7,000 to 8,400 feet. Seeds of the whitebark pine are important food for grizzly bears and a variety of other wildlife species. Whitebark pine populations in Yellowstone have been declining due to native mountain pine beetles (*Dendroctonus ponderosae*) and non-native whitepine blister rust, which is caused by a fungus, *Cronartium ribicola* (Schwandt 2006). In July 2011, the USFWS determined that whitebark pine warrants protection under the ESA, but adding the species to the Federal List of Endangered and Threatened Wildlife and Plants is precluded by the need to address other listing actions of a higher priority. This species is now added to the list of candidate species eligible for ESA protection and its status will be reviewed annually. Whitebark pine occurs sparsely in the understory around Isa Lake and is not currently considered a food source for animals. Impacts to whitebark pine would be negligible; therefore have been dismissed from further analysis.

### Historic and Prehistoric Archeological Resources

In addition to the National Historic Preservation Act, NPS Director's Order-28A Archeology affirms a long-term commitment to the appropriate investigation, documentation, preservation, interpretation, and protection of archeological resources inside units of the NPS. Archeological resources are nonrenewable and irreplaceable, so it is important that all management decisions and activities throughout the NPS reflect a commitment to the conservation of archeological resources as elements of our national heritage.

Most of the historic and prehistoric archeological sites in close proximity to Isa Lake Bridge have been evaluated for eligibility for listing on the National Register of Historic Places. No archeological sites were located during the University of Montana, Department of Anthropology Class III inventory (2010). Therefore, the proposed project area is not expected to contain archeological deposits; however, appropriate steps would be taken to protect any archeological resources that are inadvertently discovered during construction. Because the project would not disturb any known archeological sites, the effect of the project on archeological resources is expected to be negligible; therefore this topic has been dismissed from further analysis.

### Cultural Landscapes

Cultural landscapes are complex resources that range from large rural tracts covering several thousand acres to formal gardens of less than an acre. In the broadest sense, a cultural landscape is a reflection of human adaptation and use of natural resources and is often expressed in the way the land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, walls, and vegetation, and by reflecting cultural values and traditions.

The NPS Washington DC office of the Historic American Landscape documented the park's roads as cultural landscapes and submitted that documentation to the Library of Congress on January 30, 2003. As a stand-alone historic property the Isa Lake Bridge does not constitute a cultural landscape but it is part of the larger landscape of the Grand Loop Road, of which it is a contributing feature. The alternatives would not alter the cultural landscape of the Grand Loop Road or its contributing feature, the Isa Lake Bridge, due to the retention of the bridge's

character defining features of low profile log exterior elements. Therefore, the effect on cultural landscapes would be negligible and therefore has been dismissed from further analysis.

## **Ethnographic Resources**

Tribal contacts (76 persons) of all 26 Native American Tribes associated with Yellowstone National Park were individually contacted in the initial scoping stage of this project to request information about any ethnographic concerns they may have about this undertaking. To date, no concerns or additional information about ethnographic concerns in the project area have been received by the park. An individual letter to each of the tribes will also be sent with the Environmental Assessment providing an additional opportunity to comment.

Yellowstone National Park has previously completed an Ethnographic Inventory, *American Indians and Yellowstone National Park: A Documentary Overview*, Nabokov and Loendorf, 2002, and further developed an Ethnographic Resource Inventory (ERI) for use when undertakings are proposed.

A variety of common plants found throughout the Park have been identified as having been used for food, medicinal and other purposes, many of which are still used today. Some of the plants are located near the project area and include berries, roots, greens, pine nuts, seeds, bitterroot, chokecherries, wild carrots, wild onions, sage, and mint. Medicinal plants such as sage, “cedar” (Juniper), yarrow, fir, balsam, and mint were gathered and used in teas and to treat bruises, cuts, sores, infections, headaches, and toothaches. Juniper “cedar” was used for purification, prayer, and curing. All of the plants identified are common and are plentiful in many locations within and outside the park.

Similarly, a wide variety of animal resources have played a large role in the subsistence practices of many Native American people. These animals, such as bison, bear, big horn sheep, elk, antelope, deer, rabbit, and a variety of other smaller mammals are found throughout the park and outside the park in all directions. There are no unique concentrations of ethnographically used plants or animals within the area of Isa Lake. Therefore, this topic has been dismissed from further analysis.

## **Visual Quality**

Outstanding scenic character has always distinguished national parks from other areas. Yellowstone abounds with impressive viewsheds of the highest quality. The majority of Yellowstone’s landscape appears untouched by humans and retains its primeval characteristics. Less than two percent of the park is developed and visitor use facilities are predominantly grouped along the figure-eight road system and in a handful of small communities, leaving substantial acreage in its natural condition. Because the appearance of the bridge would not change substantially with this project, visual quality has been dismissed from further analysis as an impact topic.

## **Museum Collections**

According to NPS Director’s Order-24 *Museum Collections*, the NPS requires the consideration of impacts on museum collections (historic artifacts, natural specimens, and archival and manuscript material), and provides further policy guidance, standards, and requirements for preserving, protecting, documenting, and providing access to, and use of, NPS museum collections. Many of the park’s museum collections are stored in the Heritage and Research Center in Gardiner, Montana, or within one of the visitor centers of the park. The alternatives in this plan would not impact museum collections. Therefore, this topic has been dismissed from further analysis.

## Air Quality

The NPS has a responsibility to protect air quality under both the 1916 Organic Act and the Clean Air Act. The 1963 Clean Air Act, as amended (42 USC 7401 et seq.) requires federal land managers to protect Park air quality while the *NPS Management Policies* 2006 address the need to analyze air quality during Park planning. The Clean Air Act requires superintendents to take actions consistent with their affirmative responsibilities to protect air quality related values in Class I areas. Class I areas include all NPS units designated as national parks with more than 6,000 acres and all national wilderness areas with more than 5,000 acres that were in existence on August 7, 1977, and any other area redesignated as Class I by the governing state or Native American authority. The act also establishes a national goal of preventing any future and remedying any existing man-made visibility impairment in Class I areas. Yellowstone National Park extends into five counties in three states, including Park and Teton in Wyoming, Park and Gallatin in Montana and Fremont in Idaho. None of the five counties have air pollution levels that persistently exceed the national ambient air quality standards and are designated as nonattainment status (EPA, 2011). Impacts derived from this project on air quality would be short-term and negligible in a local and regional context. Impacts would be temporary and come from construction equipment emissions and dust from road work for the bridge approaches. Overall, the Class I air quality would not be affected. Because the effects on air quality would be negligible, this topic has been dismissed from further analysis.

## Soundscape Management

In accordance with *NPS Management Policies 2006* and Director's Order-47 *Sound Preservation and Noise Management*, an important component of the NPS mission is the preservation of natural soundscapes associated with national park units (NPS 2006). Natural soundscapes exist in the absence of human-caused sound. The natural ambient soundscape is the aggregate of all the natural sounds that occur in park units, together with the physical capacity for transmitting natural sounds. Natural sounds occur within and beyond the range of sounds that humans can perceive and can be transmitted through air, water, or solid materials. The frequencies, magnitudes, and durations of human-caused sound considered acceptable varies among NPS units as well as potentially throughout each park unit, being generally greater in developed areas and less in undeveloped areas.

Existing sounds in this area are most often generated from vehicular traffic and wind. Sound generated by the short-term reconstruction of the bridge would include an increase in sound from construction crews, equipment, and vehicular traffic. Some temporary displacement of wildlife could occur, but concentrated noise levels would only be expected to appreciably increase in an area that currently has a steady level of vehicular traffic. Any sounds generated from the reconstruction would be temporary, lasting only as long as the reconstruction activity is generating the sounds. Because these effects are minor or less, this topic has been dismissed from further analysis.

## Park Operations

Parks must consider the potential effects of proposed actions on overall park operations. The reconstruction of the existing bridge, improvements to the parking area, and other actions proposed with the alternatives would not require additional staff or change existing park operations. No NPS facilities are located within the project area. Increased traffic delays during construction would have an adverse impact on park staff traveling along this route, the ability to perform routine maintenance along the roadway and respond to potential emergency situations. These adverse impacts would be short-term and negligible. Therefore, park operations have been dismissed as an impact topic.

## Lightscape Management

In accordance with *NPS Management Policies 2006*, NPS strives to preserve natural ambient lightscapes, which are natural resources and values that exist in the absence of human-produced light. The NPS would limit the use of artificial outdoor lighting to that which is necessary for basic safety requirements. In addition, NPS would ensure that all outdoor lighting is shielded to the maximum extent possible to keep light on the intended subject and out of the night sky so that the contribution to surrounding light sources would be minimal. Therefore, lightscape management has been dismissed as an impact topic.

## Prime and Unique Farmlands

The Farmland Protection Policy Act of 1981, as amended, requires federal agencies to consider adverse effects to prime and unique farmlands that would result in the conversion of these lands to non-agricultural uses. Prime or unique farmland is classified by the U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS), and is defined as soil that particularly produces general crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts. Because there would be no effects on prime and unique farmlands, this topic has been dismissed from further analysis.

## Indian Trust Resources

Secretarial Order 3175 requires that any anticipated impacts to Indian trust resources from a proposed project or action by the Department of Interior agencies be explicitly addressed in environmental documents. 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. The Park's lands and resources related to this project are not held in trust by the Secretary of the Interior for the benefit of Native Americans. Because there are no Indian trust resources related to this project, this topic has been dismissed from further analysis.

## Socioeconomics

The proposed action would neither change local and regional land use nor appreciably impact local businesses or other agencies. Any increase in workforce and revenue, however, would be temporary and negligible, lasting only as long as the reconstruction. Because the impacts to the socioeconomic environment would be negligible, this topic has been dismissed.

## Environmental Justice

Executive Order 12898 *General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing disproportionately high and adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. Because the construction workforces would not be hired based on their race or income, the proposed action would not have disproportionate health or environmental effects on minorities or low-income populations or communities. Because there would be no disproportionate effects, this topic has been dismissed from further analysis.

## Climate Change and Sustainability

Although climatologists are unsure about the long-term results of global climate change, it is clear that the planet is experiencing a warming trend that affects ocean currents, sea levels,



polar sea ice, and global weather patterns. Although these changes would likely affect winter precipitation patterns and amounts in the park, it would be speculative to predict localized changes in temperature, precipitation, or other weather changes, in part because there are many variables that are not fully understood and there may be variables not currently defined. Therefore, the analysis in this document is based on past and current weather patterns and the potential effects of future climate changes are not discussed further.

### **Wilderness**

The project area has not been recommended for wilderness designation and is not managed by the NPS as wilderness. As per *NPS Management Policies 2006*, regardless of the category of wilderness, NPS “will take no action that would diminish the wilderness eligibility of an area possessing wilderness characteristics until the legislative process of wilderness designation has been completed. Until that time, management decisions will be made in expectation of eventual wilderness designation.” Because the project area occurs along a roadway and is not likely to be designated a wilderness area, this topic has been dismissed from further analysis.

## ALTERNATIVES

An interdisciplinary team of NPS employees met for the purpose of developing project alternatives. This meeting resulted in the definition of project objectives as described in the *Purpose and Need*, and a list of alternatives that could potentially meet these objectives. This EA analyzes a no action alternative and an action alternative. A summary table comparing alternative components is presented at the end of this chapter.



Figure 2 - Existing Conditions

## Alternatives Carried Forward

### Alternative A – No Action

Under Alternative A, the Isa Lake Bridge would not be reconstructed. Issues related to the aging of the existing bridge would not be addressed. The NPS would still 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. Deterioration of the bridge's structural elements would continue until safety concerns would eventually cause the closure of the bridge. Additionally, improvements would not be made to the existing parking area. The asphalt parking lot and pullout would not be resurfaced. The historic kiosk would continue to deteriorate and not be repaired. Safety concerns would not be improved. Drainage inlets and culvert pipes would not be replaced.

### Alternative B – Reconstruction of Bridge

Alternative B consists of in-kind log and wood replacement of the existing wood bridge members for a large part, and substituting suitable alternative materials for the substructure and non-visible portions of the bridge, as provided in the stipulations in Yellowstone's Road Improvement Programmatic Agreement with the Wyoming State Historic Preservation Officer and the Advisory Council on Historic Preservation. The use of appropriate compatible substitute (modern) materials, where necessary for a technologically stronger bridge, was accomplished

through consultation with the Wyoming State Historic Preservation Office. The paved width of the bridge would be widened from 26 to 30 feet and the bridge would remain on the same horizontal alignment with no shift in traffic lanes.

The reconstructed bridge would be designed to retain the historic character of the existing bridge in accordance with the Secretary of Interior's Standards on Historic Preservation. The bridge would be on the existing alignment, though due to taller girders, the bridge would be approximately 3 feet higher in grade. The approach road on each end of the bridge would be raised to meet the elevation of the new bridge. The reconstructed bridge would have two eleven-foot wide travel lanes and a four-foot wide shoulder on each side of the road. The length of the total reconstruction zone would be approximately 1,400 feet.

No additional cutting into existing slopes beyond the existing road ditch would be required, though some temporary cuts would be required in the vicinity of the west abutment for the temporary bridge. The total area of impact outside of the existing road prism, parking area, and pull outs would be 0.86 acre.

The existing bridge is currently constructed with 7 bents (sections). The new bridge would be slightly longer and would be constructed with 6 bents, each approximately 30 feet in length. The speed limit within this area of the Isa Lake Bridge would be reduced to 25 mph to improve safety for the many pedestrians in this area. Reconstruction of the Isa Lake Bridge would be funded by the Federal Lands Highway Program.

## **Components of the New Bridge**

The bridge components include; abutments, piles, concrete pier caps, deck, and rails. Components and design of the bridge would be done in such a manner to replicate the appearance of the historic bridge. A variety of span lengths were considered and discussed. FHWA's conceptual analysis determined that a 6-span configuration (bents) would be the best suited. The 6-bent configuration was considered to be the most structurally sound and cost efficient design. Quantities of materials and types of equipment described below are based on initial design and may be slightly modified during final design to accommodate site specific requirements. However, these modifications would be minimal and would not change overall project impacts

### **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 behind the existing shoreline of the lake.

### **Piles**

Piles would be 12 inch diameter steel pipe filled with concrete. The piles would be drilled, or driven, and placed into the lake bottom. Efforts to contain sediment during installation of these piles would be incorporated during the construction phase. These piles would support the concrete pier caps.

### **Concrete Pier Caps**

The concrete pier caps would be flush with the side of the bridge though extensions of simulated log ends and would extend approximately two and a half feet beyond the edge of the bridge. These log ends are proposed to be 18 inches in diameter and would help in resembling the appearance of the existing bridge.

## Deck

The deck would be constructed of 12 inch pre-stressed concrete slab units supported by the concrete pier caps. The slab units would be overlaid with a five inch thick cast-in-place concrete surface and a 2 inch asphalt wear surface to match the existing appearance of the driving surface.

## Rails

The rails would be comprised of concrete posts made to simulate log with natural log rail and curb attached to the inside of the bridge. A half timber fascia log would be attached to the outside of the bridge deck hiding the precast concrete slab units and a portion of the concrete pier caps. See Figure 2 for more details.

## Temporary Bridge

A temporary bridge would be constructed north of the existing bridge to allow vehicular access during the time that the existing Isa Lake Bridge is being reconstructed.

The temporary bridge crossing would have an estimated bridge length of approximately 265 feet, enough to span over Isa Lake and connect to each shore. Due to the length of the span, 4-6 piers may be required within the lake. Installation of the bridge and any necessary piers would be done from the shore and existing bridge. The bridge deck would be 24 feet wide and provide a single lane in each direction. The temporary bridge would be located on a detour that goes through the parking area east of the existing bridge, over Isa Lake north of the existing bridge and connects back with the main roadway west of the existing bridge. No traffic lights would be required, though a reduction in speed to 15 mph would be implemented and posted in the detour section. Traffic would continue to use the existing bridge while the temporary bridge is constructed. Once the temporary bridge is constructed, traffic would be diverted to the temporary bridge while reconstruction of the existing bridge is completed. Construction would involve removal of approximately 35 to 50 trees with a diameter breast height (dbh) ranging from 3-20 inches. The dominant overstory tree species that would be removed are subalpine fir and Engelmann spruce. Non-reproductive whitebark pine saplings that occur in the understory would be removed. At the completion of the project, the temporary bridge and any temporary piers would be removed and the construction area rehabilitated.

## Construction of Abutments

The abutments would be constructed beyond the location of the existing lake shore and would not be expected to require any temporary dewatering. Equipment would not be allowed in the lake. If any pumping of water is required it would be discharged to an upland site. The existing wooden abutments would remain in order to maintain the existing hydraulic characteristics of Isa Lake, contain material, and help maintain the appearance of the existing bridge.

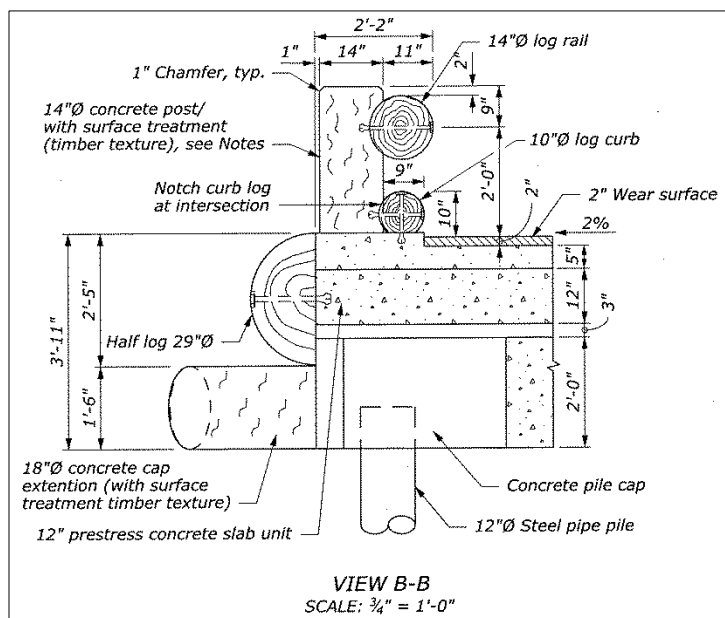


Figure 3 - Bridge Rail Section View

## **Removal of Existing Bridge**

The removal of the existing bridge would require confinement techniques to prevent the construction debris from entering Isa Lake. Potential demolition techniques to minimize environmental impacts include raised netting, tarps suspended beneath the removal area, and use of small localized equipment. Removing old piers and installing new piers requires work within the waterway and would generate turbidity. Existing log piers would be removed from the lake bed entirely, or cut near the floor level of the lake.

## **Work in Isa Lake**

Turbidity would occur during removal and installation of piles. Turbidity monitoring and limits would be conducted to meet any requirements stated in a Wyoming Department of Environmental Quality (WYDEQ) 401 permit that would be obtained for the project. In order to isolate turbidity, silt curtains or other means of separating the work zone from the rest of the lake would be utilized. Cranes would likely be used to set the temporary bridge but would not be allowed to be located within the lake itself.

## **Parking Areas**

The existing parking would be regraded due to the change in height of the approach road that is required due to the increased height of the reconstructed bridge. Universal access would be improved with installation of a curb cut and a delineated handicap parking space near the existing kiosk. Replacement log curbs would be installed around the perimeter of the existing parking area. The existing walkway would be repaved except the existing flagstone around the kiosk would be left as is. The kiosk would be repaired and a new interpretive panel installed. The Continental Divide sign currently on the east end of the parking area would be moved to the west side of the parking area near the reconstructed bridge. This sign would be moved to accommodate photo opportunities while improving safety for visitors. Drainage inlets and culvert pipes would be replaced as needed. Two existing pullouts currently exist on the west side of the bridge. The larger one on the south side of the road would be regarded and repaved at its existing configuration; while the gravel pullout located on the north side would be formalized and paved to improve safety and accommodate 3-4 vehicles.

## **Material Source**

Approximately 3,400 tons of material would be required to build up the road approaches on either side of the bridge to meet the increased height of the bridge. This material would come from an approved certified weed free source outside the park, or an existing material stockpile within the park. Approximately 1,750 tons of road aggregate would be imported and used for base material under the pavement. Approximately 1,200 tons of material would be imported to produce hot asphalt used to pave the road and bridge. This equates to a total of about 4,200 cubic yards of material that would be hauled through the park for this proposed project. If from a source outside the park, it would likely be hauled in from either the West or South Entrances to the park. All loads would be tarped and no engine brakes would be used in or near developed areas and campgrounds.

## **Surcharge of West Bridge Abutment Surcharge of West Bridge Abutment**

The design of the replacement bridge would use girders that are thicker than the existing log girders of the present bridge. This extra thickness would result in a bridge deck surface that sits approximately 3 feet higher than the existing bridge. In order to meet this new bridge deck elevation, the roadway approaches would need to gradually ramp up to this level. This would entail adding embankment material (soil and gravel) up to the level of the bridge. The extra weight of this material is likely to compress an existing layer of peat that was found from 11-14

feet below the surface on the west side of the bridge near the proposed abutment. To avoid the peat layer compressing over time and causing damage to the new bridge approach and abutment, the area above the peat layer would be weighted (surcharged) with additional soil and gravel (beyond the three feet needed) to pre-compress the peat layer. The material would be left for at least six months and up to a year prior to building the approach in this area.

### **Staging, Stockpiling, and Disposal Areas**

Staging and stockpiling areas would be needed for equipment and materials. Staging and stockpiling areas would be located in the existing parking area (including the unpaved median) located north of the road and east of the bridge, and at the existing turnout south of the road and west of the bridge, or within the construction limits of the portions of the existing road that are closed to traffic. Three other turnouts are located within a mile in each direction of the site, two west of the bridge and one east. These turnouts, if needed, would also be used for staging of equipment, materials, and as a designated area for parking a fuel truck. The existing parking lot and turnout would be closed to visitor use for the duration of the project.

Asphalt and concrete for this project are envisioned to be hauled in from outside the park, though if needed, a concrete batch plant and asphalt pug mill would be located at the Madison landfill pit (an existing maintenance area within the park). If washing of aggregate is required a lined pond would be constructed to ensure sedimentation in nearby waters does not occur.

Materials from the existing bridge not deemed beneficial to the park would be removed and disposed of properly outside of the park boundaries. Any excess embankment material generated would be stored for later use at any of the existing maintenance pits within the park for later use.

### **Water Source and Water Disposal**

Water that would be used for dust control, compaction of base material, and incidental needs related to the construction would be drawn from Lewis Lake or from Isa Lake itself.

Approximately 320,000 gallons would be needed over the duration of the two-year project. Daily water requirements are not expected to exceed about 8,000 gallons per day (enough to drop the lake level about 1/20 of an inch). Use of Isa Lake itself has the least risk of introduction of any aquatic invasive species (AIS) into the lake. 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 south and east of the existing bridge. The existing lake shore would be maintained with no alterations or changes to existing hydrology of the lake.

### **Erosion Control**

This project would utilize filter barriers and best management practices to protect existing water sources and maintain turbidity and sedimentation at the lowest practical level during construction activities. A stormwater pollution prevention plan and a water quality monitoring plan would be required before implementation of the project. Turbidity curtains would be set up within the lake around any in-water work areas such as pier removal and placement.

### **Schedule**

The project is scheduled to begin in early summer of 2014 (dependent upon funding availability) and would take approximately two years to complete. 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 time work may occur and a few night closures from 11:00 pm to 7:00 am are

also possible; if they occur they would be advertised in advance. All required permits would be obtained prior to construction.

### **Contractor Housing**

During construction, project contractors would be housed at the established contractor camps located within the park, or lodging outside the park. 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 proper food and garbage storage, how to avoid disturbing or encountering bears, and how to minimize unavoidable effects or encounters. 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. No new contractor camps would be established within the park.

## **Mitigation Measures**

The following mitigation measures were developed to minimize the degree and/or severity of adverse effects and would be implemented during construction of the action alternative, as needed:

### **General Construction**

No rip-rap would be placed in or along Isa Lake as part of this project.

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.

Dust generated by construction would be controlled by spraying water on the construction site, if necessary.

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 occur at least 100 feet 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 that all contractors and subcontractors are informed of the penalties for illegally collecting artifacts or intentionally damaging paleontological materials, archeological sites, or historic properties. Contractors and subcontractors would also be instructed on procedures to follow in case previously unknown paleontological or archeological resources are uncovered during construction.

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 National Park Service also reduces energy costs, eliminates waste, and conserves energy resources by using energy-efficient and cost-effective technology.

## **Soils and Geology**

If unknown conditions or problems are encountered during the placement of bridge piers for the temporary bridge or the reconstructed bridge, the YNP 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.

## **Water Resources**

Stormwater 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 to minimize post-construction run-off.

Equipment would not be allowed to operate within the Lake. 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 Isa Lake.

Construction vehicles could leak fluids into the lake 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 lake and wetlands when feasible. This would include secondary containment for all fuel storage tanks and on-site availability of a spill kit.

Sediment curtains would be used when needed, such as pulling existing piers, and in water work to contain sediment to the immediate work zone.

Design would be completed in such a way as to leave the shoreline of the lake in its present configuration with no change to hydraulics of the lake.

## **Visitor Use and Experience**

Signs would be posted and press releases done to inform visitors about construction and traffic delays.

Traffic flow would be maintained through the construction zone via a detour route over the temporary bridge. Speed limit through the construction zone would be posted at 15 mph.

Equipment would not be allowed to idle longer than 15 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.

## **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.

Prior to any alteration of the historic bridge, Historic American Engineering Recordation would be completed, per the stipulations of the park Programmatic Agreement for the road program and provided for SHPO review and comment. (This has already been completed).

Documentation of Yellowstone's roads as a cultural landscape was completed by the NPS Washington Office in January, 2003 and submitted to the Library of Congress.

The Ethnographic Resource Inventory of resources found within the park important to Native American people has been compiled and was consulted in the initial planning of this undertaking.

Extensive consultation with the WYSHPO has taken place on-site of the Isa Lake Bridge and with design review of the historic character defining features to insure that the plans progressed without adverse effect to the historic bridge or road.

## Alternatives Considered and Dismissed

As the existing road alignment and bridge sit in the bottom of a narrow valley through the mountains, and any change would involve considerable grading of the hillsides, a reroute of the road was not considered. There were no other alternatives identified that would offer a viable and feasible alternative to a bridge in this location. Rerouting of the road would involve additional resource damage, cost, closure time. Any change to the alignment of the road was ultimately dismissed from further analysis.

## Alternative Summaries

Table 1 summarizes the major components of the alternatives and compares the ability of these alternatives to meet the project objectives identified in the Purpose and Need chapter. As shown in the following table, Alternative B meets all the objectives identified for this project, while Alternative A does not meet the objectives.

**Table 1 – Alternatives Summary and Project Objectives**

Alternative A – No Action	Alternative B – Reconstruct Bridge on Existing Alignment
The condition of the bridge would not be improved to an excellent rating condition. The abutments, piles, concrete pier caps, deck, and rails would not be replaced.	The condition of the bridge would be improved to an excellent rating condition. The abutments, piles, concrete pier caps, deck, and rails would be replaced.
The vehicular load capacity for the bridge would continue to decrease over time by not replacing critical elements.	The reconstructed bridge would meet current bridge standards for vehicular load capacity of this road.
The safety of the bridge and adjacent parking and pullout areas would not be improved.	The safety of the bridge and adjacent parking and pullout areas would be improved through striping, parking delineation, and updated bridge elements.
Deterioration of the bridge's structural elements would continue and eventually cause the closure of the bridge. Closure of the bridge would not maintain visitor access on this section of the Grand Loop Road into the future.	Reconstruction of the bridge to retain its historic appearance and rehabilitation of the Grand Loop Road would maintain visitor access on this section of the Grand Loop Road into the future. Preserving the historic integrity of the Grand Loop

Preserving the historic integrity of the Grand Loop Road and the visual historic integrity of the Isa Lake Bridge would not be accomplished.	Road and the visual historic integrity of the Isa Lake Bridge would be accomplished.
<b>Meets Project Objectives?</b>	<b>Meets Project Objectives?</b>
No. Does not meet any of the five objectives identified in the Purpose and Need. Project objectives would not be fulfilled because the deteriorated condition of the bridge and safety issues with the parking and pullout areas would not be addressed.	Yes. Meets all five objectives identified in the <i>Purpose and Need</i> . Project objectives would be fulfilled by addressing the deteriorated condition of the bridge and safety issues with the parking and pullout areas.

Table 2 summarizes the anticipated environmental impacts for Alternatives A and B. Only those impact topics that have been carried forward for further analysis are included in this table. The *Affected Environment and Environmental Consequences* chapter (Chapter 3) provides a more detailed explanation of these impacts.

**Table 2 – Environmental Impact Summary by Alternative**

<b>Impact Topic</b>	<b>Alternative A – No Action</b>	<b>Alternative B – Preferred Alternative</b>
<b>Water Resources and Wetlands</b>	Local, short-term, negligible to minor, adverse impacts due to ongoing maintenance activities of having to stabilize the bridge.	Short-term, moderate, adverse impacts on water resources and wetlands from bridge reconstruction and construction of the temporary bridge.
<b>Geology and Soils</b>	Local, short-and long-term, negligible to moderate and adverse from previous impacts.	Short-and long-term, minor to moderate, beneficial and adverse impacts from improvements to log curbs in the parking area and drainage inlets and culvert pipes and parking area and kiosk.
<b>Vegetation and Rare Plants</b>	Short-and long-term, minor, adverse impacts from the removal and damage to vegetation and an increased potential for the introduction of non-native weed species. Rare plants would not be impacted.	Short-and long-term, minor, adverse impacts to vegetation as a result of tree removal for the temporary bridge, disturbance to the understory, and the loss of individual plants. Rare plants would not be impacted.
<b>Historic Structures</b>	Long-term, moderate, adverse impacts (eventual adverse affect under § 106 of NHPA)	Long-term, moderate, adverse impacts (no adverse effect § 106 of NHPA)
<b>Visitor Use and Experience</b>	Short-and long-term, minor to moderate, adverse impacts from increased bridge maintenance activities and eventually complete closure.	Long-term, minor, beneficial effects to visitor experience and health and safety by stabilizing the bridge and widening travel lanes, and improvements to the pullouts, parking area, and kiosk.

## Environmentally Preferable Alternative

According to the CEQ regulations implementing NEPA (43 CFR 46.30), the environmentally preferable alternative is the alternative “that causes the least damage to the biological and physical environment and best protects, preserves, and enhances historical, cultural, and natural resources. The environmentally preferable alternative is identified upon consideration and weighing by the Responsible Official of long-term environmental impacts against short-term impacts in evaluating what is the best protection of these resources. In some situations, such as when different alternatives impact different resources to different degrees, there may be more than one environmentally preferable alternative.”

Alternative B, *Reconstruct Bridge along Existing Alignment* is the environmentally preferred alternative for several reasons: 1) Alternative B would meet the health and safety objectives of the project, while minimizing environmental impacts to the greatest extent possible. 2) Alternative B would keep the piers close to their existing locations and would require less permanent disturbance outside the existing roadway. 3) A temporary bridge would require temporary disturbance outside the existing roadway, but would allow visitor traffic to continue through the construction zone mostly unimpeded. 4) The bridge design for Alternative B would maintain the cultural integrity of the bridge and the Grand Loop Road. For these reasons, Alternative B causes the least damage to the biological and physical environment and best protects, preserves, and enhances historical, cultural, and natural resources, thereby making it the environmentally preferable alternative.

By contrast, Alternative A, *No Action* is not the environmentally preferable alternative because, although there would be no construction or ground disturbing activities, it would not address: 1) the inherent safety concerns of the aging structure, 2) seismic concerns, fracture critical aspects, and the deteriorating bridge deck would not be addressed, 3) this alternative does not proactively allow the NPS to maintain into the future a lake crossing for park visitors along the Grand Loop Road at Craig Pass.

## Preferred Alternative

No new information came forward from public scoping or consultation with other agencies to necessitate the development of any new alternatives, other than those described and evaluated in this document. Alternative B is the environmentally preferable alternative and better meets the project objectives; therefore, it is also considered the NPS preferred alternative. For the remainder of the document, Alternative B will be referred to as the preferred alternative.

## AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

This chapter describes the affected environment (existing setting or baseline conditions) and analyzes the potential environmental consequences (impacts or effects) that would occur as a result of implementing the proposed project. Direct, indirect, and cumulative effects are analyzed for each resource topic carried forward. Potential impacts are described in terms of type, context, duration, and intensity. General definitions are defined as follows, while more specific impact thresholds are given for each resource at the beginning of each resource section.

**Type** describes the classification of the impact as beneficial or adverse, direct or indirect:

*Beneficial:* A positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition.

*Adverse:* A change that moves the resource away from a desired condition or detracts from its appearance or condition.

*Direct:* An impact that is caused by an action and occurs at the same time and place as the action.

*Indirect:* An impact that is caused by an action but occurs later in time at another place or to another resource.

**Context** describes the area or location in which the impact would occur. Effects may be site-specific, local, regional, or even broader.

**Duration** describes the length of time an effect would occur, either short-term or long-term:

*Short-term* impacts are temporary, transitional, and generally associated with construction and removal activities.

*Long-term* impacts are typically those effects that continue to occur after construction or removal activities and last 10 year or more, and could be considered permanent.

**Intensity** describes the degree, level, or strength of an impact. For this analysis, intensity has been categorized into negligible, minor, moderate, and major. Because definitions of intensity vary by resource topic, intensity definitions are provided separately for each impact topic analyzed in this EA.

### Cumulative Impact Scenario

The CEQ regulations which implement NEPA require assessment of cumulative impacts in the decision-making process for federal projects. 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). Cumulative impacts are considered for both the no action and preferred alternatives.

Cumulative impacts were determined by combining the impacts of the preferred alternative with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other ongoing or reasonably foreseeable future projects at YNP and, if applicable, the surrounding region. Because the scope of this project is relatively small, the geographic and temporal scope of the cumulative analysis is similarly small. The geographic scope for this

analysis includes actions within YNP's boundaries, while the temporal scope includes projects within a range of approximately ten years. Given this, the following projects were identified for the purpose of conducting the cumulative effects analysis, listed from past to future:

- Old Faithful Snow Lodge Construction (2006)
- Old Faithful Inn Phase I, II, III Rehabilitation (2006-2008)
- Removal of the Old Faithful Pub (2009)
- Old Faithful Inn Old House East Wing Bathroom/Shower Room Rehabilitation (2009)
- Old Faithful Inn Housekeeping Dock Construction (2009)
- Old Faithful Inn Old House Elevator and Laundry Storage Rotunda Addition (2009)
- Delaware North Yellowstone General Store Upper Store Exterior Restoration and New Roof (2009-2010)
- Old Faithful Visitor Education Center Construction (2010)
- Removal and Relocation of the Old Faithful Haynes Photo Shop (2011)
- Old Faithful Inn Rehabilitation - Phase IV (2012)

## Water Resources and Wetlands

### Affected Environment

#### Water Resources

Water resources, riparian and aquatic related values, are park resources managed under the authorities of the NPS Organic Act, the Clean Water Act, Executive Orders 11990 (Protection of Wetlands) and 11988 (Floodplain Management), Director's Orders 77-1 and 77-2 and Management Policy 4.6 (Water Resource Management). Streams and lakes in Yellowstone are designated as Class I, Outstanding Resource Waters, by the state of Wyoming. Class I waters are not allowed further water quality degradation by point sources of pollution, and existing water quality must be maintained.

Isa Lake is a small, shallow oblong lake that straddles the Continental Divide at Craig Pass at an approximate elevation of 8,277 feet. It is approximately a half acre in size and does not contain any fish species. The lake is unusual because it is believed to be one of the only lakes in the world which drains to both the Gulf of Mexico and the Pacific Ocean. The western portion drains by way of Spring Creek to the Firehole River, to the Madison River, then via the Missouri and Mississippi Rivers into the Gulf of Mexico. The eastern portion of the lake drains by way of DeLacy Creek to Shoshone Lake, then into the Lewis River, the Snake River and lastly into the Columbia River via its way into the Pacific Ocean. Annual precipitation in the project vicinity averages about 24 inches which includes approximately 212 inches of total snowfall. Most of the rainfall occurs during the early summer months of May and June. The highest amount of snowfall occurs during the months of December and January.

#### Wetlands

In July 2012, NPS staff conducted a wetland survey of the project area. Within the surveyed area, two wetlands, totaling 0.062 acres were mapped (Figure 3). The survey delineated one type of wetland; Palustrine Forested Wetland(0.016 acre). A Palustrine Forested Wetland (as per the 1979 Cowardin et. al Wetland Classification System) is described as non-tidal, typically dominated by at least 30 % trees, shrubs, etc. Dominant herbaceous species found in this wetland included: western huckleberry (*Vaccinium occidentale*), water sedge (*Carex aquatilis*), softleaf sedge (*Carex disperma*), and bluejoint reedgrass (*Calamagrostis canadensis*). The



overstory consisted of Douglas fir (*Pseudotsuga menziesii*) and subalpine fir (*Abies lasiocarpa*). The other wetland was an ephemeral drainage ditch (.046 acre) on the northeast side near the parking area. This ditch drains from Isa Lake during spring snowmelt but is dry by early summer. The ditch is void of vegetation and mostly within a paved waterway. It is approximately 3 feet wide at the beginning and then narrows.



**Figure 4 - Isa Lake Wetlands**

Work to install and replace abutments and piers for the temporary bridge and reconstruction of the existing bridge would occur adjacent to, and within Isa Lake. To ensure compliance with the Clean Water Act, a Wyoming Department of Environmental Quality (DEQ) State 401 Certification and U.S. Army Corp of Engineers Section 404 permit would be obtained for all work

within the waters of the U.S. and adjacent wetlands. A National Pollutant Discharge Elimination System (NPDES) and a Temporary Turbidity Increase from the Wyoming DEQ would be obtained.

This project could increase the possibility of debris and pollutants entering the lake and adjacent wetland during construction. An oil/hazardous material spill contingency plan would be required to be prepared prior to construction by the contractor.

### Methodology and Intensity Level Definitions

The methodology used for assessing impacts to water resources and wetlands included park staff knowledge of the resources and site, wetland surveys, and review of discussions with the interdisciplinary project team. For purposes of analyzing potential impacts to water resources and wetlands, the thresholds of change for the intensity of an impact are defined as follows:

- Negligible:** An action would have no measurable or detectable effects on water resources. No measurable or perceptible changes in wetland size, integrity or continuity would occur.
- Minor:** An action would have measurable effects on water resources. Water quality effects could include increased or decreased loads of sediment, debris, chemical or toxic substances, or pathogenic organisms. Impacts would be measurable or perceptible but slight. A small change in wetland size, integrity or continuity could occur due to short-term effects from construction related activities.
- Moderate:** An action would have clearly detectable effects on water resources and potentially would affect organisms or natural ecological processes. Alternatively, an impact would be visible to visitors. Any impact would be sufficient to cause a measurable change in wetland size, integrity or continuity or would result in a small, temporary or permanent loss or gain in wetland acreage.
- Major:** An action would have substantial effects on water resources quality and potentially would affect organisms or natural ecological processes. Alternatively, an impact would be easily visible to visitors. The action would result in a measurable change in all three wetland parameters (size, integrity and continuity) or a permanent loss of wetland areas. The impact would be substantial and highly noticeable.

### Impacts of Alternative A- No Action

Under Alternative A, no action would be taken to reconstruct the existing bridge. Water resources and wetlands would not be impacted because reconstruction of the existing bridge's piers and abutments would not be replaced and a temporary bridge would not be constructed. The current bridge would remain as is, though routine maintenance 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 protect water resources and wetlands. Impacts from this alternative to water resources and wetlands would be negligible.

Cumulative Effects: Past, present, and reasonably foreseeable future actions with the potential to affect water resources and wetlands include ongoing road and bridge maintenance, emergency bridge protection measures, and runoff from the road and pullouts. These actions have the potential to affect water resources and wetlands by increasing erosion, which would

increase turbidity and conductivity, resulting in short-term, negligible to minor, adverse impacts on water resources and wetlands. The no action alternative would contribute slightly to the overall short-term adverse, cumulative effects on water resources and wetlands as these activities would continue in the future under this alternative. The overall cumulative impacts on water resources and wetlands from past, present, and reasonably foreseeable future projects, in combination with the impacts of the no action alternative would be short-term, negligible to minor, and adverse.

### **Impacts of Alternative B (Preferred Alternative) - Reconstruct Bridge on Existing Alignment**

Under the preferred alternative, reconstructing the existing bridge would require replacing the abutments, piles, concrete pier caps, deck, and rails. Replacing these components as well as constructing a temporary access bridge would disturb the lake bottom and temporarily generate increased turbidity. No heavy equipment would operate within the lake. Equipment would be located on shore or on the existing bridge for all work that is required within the lake. Work would be done in a manner that would minimize movement of lake sediment and reduce any increases in turbidity. In addition, all equipment would be inspected to ensure prevention of transporting nonnative species and that fuel or lubricants are not visible on the outside of the equipment and would not leak during use of the equipment at the work site. Best management practices outlined in the *Mitigation Measures* section would be implemented to prevent spills of fuel, cement, or other products associated with the bridge reconstruction.

Moderate, short-term, adverse impacts to water resources and wetlands associated with reconstruction of the bridge and temporary bridge would include: temporarily covering the one forested wetland (0.016 acre) identified within the project area (Figure 3) with fill material for the temporary bridge; an increase in turbidity from installation and removal of bridge piers; a potential increase in erosion from construction of the bridge abutments, and regrading of the parking lot and road. The temporary bridge would be removed when reconstruction of the existing bridge is completed and temporary fill would be removed from the wetland, the area replanted, and the area would be rehabilitated. This project would incorporate “Best Management Practices” listed in Appendix 2 of the Director's Order 77-1: *Wetland Protection, Procedural Manual*, and no Wetlands Statement of Findings for this project will be prepared.

Cumulative Effects: As stated above, past, present, and reasonably foreseeable future actions with the potential to affect water resources and wetlands include road and bridge maintenance, emergency bridge protection measures, and runoff from the road and parking lot. These actions could result in increased turbidity and short-and long-term, negligible to minor, adverse impacts on water resources and wetlands. The preferred alternative would result in short-term moderate adverse effects during construction, but would also result in a long-term, beneficial effect on water resources by stabilizing the bridge from future deterioration. Therefore, the overall cumulative impacts on water resources and wetlands from past, present, and reasonably foreseeable future projects, in combination with the impacts of the preferred alternative would be short- and long-term, minor to moderate, beneficial and adverse.

## **Geology and Soils**

### **Affected Environment**

South of Old Faithful, Isa Lake is within the Wyoming portion of the Yellowstone Plateau physiographic province, a high-elevation, dynamic landscape. Thousands of earthquakes per year and active ground deformation (centimeters per year) characterize this geologically active area (Yellowstone Volcano Observatory website). Isa Lake occupies a topographic depression

within the 164,000 year Mallard Lake rhyolite flow (Christiansen and Blank 1974; Christiansen et al. 2007) by Craig Pass.

Although separate from the North American ice sheet, the Yellowstone Plateau ice cap covered the entire Yellowstone area and began stagnating as the climate warmed around 14,000 Before Present (Liccardi and Pierce 2008). Previous geologic mapping (Waldrop and Pierce 1975) identified Pinedale-age meltwater channels in the general area of Isa Lake. Isa Lake occupied a topographic depression that became filled with sediments (Jaworowski 2012). Late or post-glacial physical weathering in the pass formed debris fields and nivation hollows (Jaworowski 2012). During spring thaw, seasonal snow remains in this topographic notch as alternate freezing and thawing loosens rocks from the hillsides. Rocks roll over the seasonal snow field and form a block-rich ridge around the melting snow. After the seasonal snow melts, a small depression or nivation hollow remains. Soils developed in this high-elevation area have thin soils over bedrock and are mapped as “inceptisols with low base saturation” (Rodman et al. 1996).

In early summer 2012, geotechnical borings were completed within the footprint of the proposed project area. The boring depths ranged from 25 to 85 feet below the existing bridge deck. The borings encountered layers of silty, loose to medium dense and silty sand, silty sandy gravel fill, very soft organic lake deposits, and rhyolite bedrock. The very soft organic layer was approximately 10 feet thick and was encountered in the lake and below one of the abutments (FHWA Geotechnical Memorandum 2012).

### Methodology and Intensity Level Definitions

The methodology used for assessing impacts to geology and soils was derived from available information and park staff’s observations. For purposes of analyzing potential impacts to geology and soils, the thresholds of change for the intensity of an impact are defined as follows:

**Negligible:** Geology and soils would not be affected or the effects on geology and soils would not be detectable.

**Minor:** Impacts on geology and soils would be detectable, although these effects would be localized. There could be some slight physical disturbance or removal of and/or some soil compaction. Mitigation measures proposed to offset adverse effects would include measures to ensure that geologic features and topsoil is preserved, the ground is reshaped to natural contours, and that there is no unnatural erosion of soils.

**Moderate:** Impacts on geology and soils would be readily detectable, localized, but possibly long-term. Measurable effects could include physical disturbance and removal of large amounts of soil, compaction, and, possibly, unnatural erosion of soils. Mitigation measures proposed to offset adverse effects would be extensive and would include measures to ensure that geologic features and topsoil is preserved, ground is reshaped into the natural contours, and that no unnatural erosion occurs.

**Major:** Impacts on geology and soils would be widespread, readily detectable, and long-term and could have permanent consequences. Significant measurable effects would include the physical disturbance and removal of large amounts of soil, compaction, and the unnatural erosion of soils. Mitigation measures proposed to offset adverse effects would be extensive and success would not be assured.

## Impacts of Alternative A- No Action

Under Alternative A, geology and soils would not be impacted as piers, abutments, and a temporary bridge would not be constructed. The current bridge would remain as is, though routine maintenance would continue until safety concerns force the eventual closure of the bridge. Short-term, negligible, adverse impacts may occur in the project area from activities such as ditch cleaning, culvert and bulkhead maintenance. Protective measures (i.e., topsoil conservation and erosion control) would be implemented to protect geology and soil resources.

Geology and soils surrounding the project area have been disturbed numerous times over the years, most recently with the widening of the Craig Pass Road in 1988 which resulted in short- and long-term, moderate, adverse impacts. Near the parking area, long-term, negligible impacts to geology and soils would continue to occur along the perimeter of the parking area where visitors walk to view and photograph the lake. The exposed soil in this area would continue to erode and compact. Deterioration of the pavement and log curbs on the shoulder of the parking area would continue, which would result in minor erosion and soil loss.

Cumulative Effects: Past, present, and reasonably foreseeable future actions with the potential to affect geology and soils include past actions for the Craig Pass road reconstruction, ongoing road and bridge maintenance, erosion, and compaction from the road and parking area. These actions have the potential to result in short- and long-term, negligible to moderate, adverse impacts. The no action alternative would contribute slightly to the overall long-term adverse, cumulative effects on geology and soils as these activities would continue in the future under this alternative. The overall cumulative impacts on geology and soils from past, present, and reasonably foreseeable future projects, in combination with the impacts of the no action alternative would be short- and long-term, negligible to moderate, and adverse.

## Impacts of Alternative B (Preferred Alternative) - Reconstruct Bridge on Existing Alignment

Under the preferred alternative, reconstructing the existing bridge and constructing a temporary bridge would impact geology and soil resources. Activities associated with this alternative would disrupt soil chemical, physical, and biological processes. The total area of new soil disturbance would be approximately 0.86 acre. There would not be an increase in pavement for the parking area and pullouts.

Also, in this alternative, trees would be removed at the northwest end of the lake to provide access for the temporary bridge. The loss of the root structures and perennial shade could alter the soil microclimate. To lessen impacts associated with this alternative, topsoil management guidelines would be followed. Following the work, topsoil would be returned to the area, revegetated, and monitored for invasion by non-native species. Disturbance and loss of geology and soil resources would be a short- and long-term, moderate, adverse impact to the project area.

Improvements to log curbs in the parking area and drainage inlets and culvert pipes would result in long-term beneficial impacts to soil resources in the project area by reducing erosion. The replacement of drainage inlets and culvert pipes could result in long-term adverse impacts to geology. Moving the Continental Divide sign to the west end of the parking area would result in new disturbance to soils from placement of the sign and visitor use of the area. These impacts would be long-term, minor, and adverse. These impacts would be offset by the restoration of the area of the signs current location.

Cumulative Effects: Past actions have altered geology and soil resources in areas within the project area, including development of the parking area, addition of the kiosk, drainage inlets

and culvert pipes. Since the geology and soils have been altered by past actions, the proposed project actions would have a short- and long-term, minor to moderate, adverse impact on soils in the project area.

## Vegetation including Rare Plants

### Affected Environment

The park botanist and vegetation staff surveyed the project area during the summer of 2012. The project area is surrounded by a typical subalpine forest in YNP with lodgepole pine (*Pinus contorta*), Engelmann spruce (*Picea engelmannii*), subalpine fir (*Abies bifolia*), and whitebark pine (*Pinus albicaulis*). Understory vegetation is dominated by grouse whortleberry (*Vaccinium scoparium*), elk sedge (*Carex geyeri*), and various forbs and shrubs such as Utah honeysuckle (*Lonicera utahensis*). Yellow pond lilies (*Nuphar polysepalum*) grow throughout the lake, while the shoreline is dominated by various sedge species such as water sedge (*Carex aquatilis*), horsetails, (*Equisetum arvense*) with smooth brome (*Bromus inermis* var. *inermis*) invading from the road edge. There is an extensive talus field on the south side of the lake with yellow columbine (*Aquilegia flavescens*) growing amongst the rocks.

The only federally listed species that occurs near YNP is Ute ladies'-tresses (*Spiranthes diluvialis*), which is listed by the U.S. Fish and Wildlife Service as a threatened species. Even though Ute ladies'-tresses is known from Montana, Wyoming, and Idaho, it has not been located within the confines of YNP. The populations in the adjacent states are at lower elevations and occur in somewhat different plant communities than are present within the park, making the occurrence of this species within YNP unlikely.

Three endemic plant species occur only in YNP. Ross' bentgrass (*Agrostis rossiae*) occurs in geothermal areas along the Firehole River and in the Shoshone Geyser Basin. Yellowstone sand verbenas (*Abronia ammophila*) is restricted to sandy lakeshores around Yellowstone Lake. Yellowstone sulfur buckwheat (*Eriogonum umbellatum* var. *cladophorum*) is known from the Upper Geyser Basin to Madison on thermally influenced barren sites. None of these species are likely to occur in the project area and were not located during the survey.

Though there are no plant species protected by state law in Wyoming, and only four federally listed taxa which occur in the state, there are many species that are quite rare. Two rare plant species present in the proposed area of disturbance for this project include: Whitebark pine (*Pinus albicaulis*) a USFWS Category 1. Whitebark pine is a common component of subalpine forests and a dominant species of treeline and krummholz habitats. Whitebark pine is extensive and common in the subalpine of YNP, and is present as a component of the understory in more forested areas due to seed caches of Clark's nutcrackers (*Nucifraga columbiana*). In the immediate vicinity of the proposed route for the temporary bridge there are relatively few (<25) non-reproductive whitebark pine saplings that occur in the understory would be removed. These trees are not considered a food source for bears in the area. There are approximately 2-5 whitebark pines in the area that are about 10 meters in height that would be lost due to construction of the temporary bridge. The other plant species of concern that occurs in the project area is crimped stitchwort (*Stellaria crispa*). Crimped stitchwort is a small diminutive herb that can be easily overlooked in wetlands and moist woods where it occurs. The distribution of the species is purely in western North America, with the easternmost sites in Alberta, Montana and Wyoming spreading west to California and north to Alaska. The occurrences are often composed of very few individuals, so even though there may be several sites in an area, the number of plants can be quite small. In YNP, the species inhabits moist woods and wetlands at several locations scattered about the park, usually in areas that have at least some overstory component creating a somewhat shaded environment, though it can be in

the open along ponds such as at Isa Lake. This species was removed this year from the Wyoming list, rendering it of limited concern.

### **Methodology and Intensity Level Definitions**

The methodology used for assessing impacts to plant resources are based on the results of the 2012 rare plant survey that encompassed the project area. For purposes of analyzing potential impacts to vegetation and rare plant resources, the thresholds of change for the intensity of an impact are defined as follows:

- Negligible:** Vegetation and/or rare plants would not be affected or the chances would be so slight that they would not be of any measurable or perceptible consequences to the species' population.
- Minor:** Vegetation and/or rare plants would be affected over a relatively small area, but the effects would be localized, and would be of little consequence to the species' population.
- Moderate:** Vegetation and/or rare plants would be affected over a relatively wide area or multiple sites and would be readily noticeable. A sizeable segment of a species' population may be affected.
- Major:** Considerable long-term negative effects on vegetation and/or rare plant populations over a relatively large area of the park would occur. Extensive mitigation measures to offset the adverse effects would be required, and success of the mitigation measures would not be guaranteed.

### **Impacts of Alternative A- No Action**

Alternative A would not result in any new construction, excavation, or ground disturbance. Tree removal would not occur from construction of the temporary bridge. Therefore, there would be no additional impacts to vegetation. Vegetation in the project area has been altered in the past from routine maintenance, paving the parking area, visitors walking the perimeter of the lake and viewing the Continental Divide sign, pullouts, and the bridge itself. There would continue to be non-native weed species present in the area. Disturbance of vegetation would continue from visitors trampling vegetation and creating social trails. The no action alternative would result in minor, long-term, adverse impacts to native vegetation in the project area.

**Cumulative Effects:** Past, present, and reasonably foreseeable future actions with the potential to affect vegetation include past disturbance in the area include maintenance activities of the road, bridge, parking area, pullouts, and ditch cleaning. Impacts to vegetation arise from removal, damage, and the potential introduction of non-native weed species. These actions have resulted in short- and long- term, negligible to minor, adverse impacts on vegetation in the project area.

### **Impacts of Alternative B (Preferred Alternative) - Reconstruct Bridge on Existing Alignment**

The preferred alternative would have adverse impacts on vegetation in the project area. Construction of a temporary bridge would remove 0.14 acre of vegetation, 0.02 acre of this amount is wetland vegetation as described in the Water Resources and Wetlands section of this document. Approximately 35 to 50 trees with a diameter breast height (dbh) ranging from 3-20 inches would be removed. The dominant overstory trees species that would be removed are subalpine fir and Engelmann spruce. Relatively few (<25) whitebark pine saplings that occur in the understory would be removed. These trees, along with the rest of the whitebark pine in the area are not considered a food source for bears. There are approximately 2-5 whitebark pines in



the project area that are about 10 meters in height that would be removed due to construction of the temporary bridge. These impacts would have moderate, long-term, adverse effects on vegetation. The Continental Divide sign would be moved to the west side of the existing parking area. Impacts to vegetation immediately surrounding the new location would be offset by revegetating the current location of the sign.

The loss of native vegetation would not affect the viability of local plant populations, and with the application of mitigation measures to minimize disturbance, there would be a short- and long-term, minor, adverse impact on vegetation in this area. Implementation of mitigation measures includes following topsoil management guidelines such as salvaging topsoil, preserving existing native vegetation to the extent possible, using only weed-free certified materials, and replacing topsoil on the original location after construction. Despite all of these mitigation measures, a potential for the spread of non-native weed species exists. Consequently, there would be a long-term, minor, adverse impact on native vegetation due to the proposed project. Minor, short-term disturbances to vegetation would occur at the location of the culvert ends and drainage inlets and within the roadside ditches.

The existing median within the parking area would be used for equipment and material storage but would be reestablished at the completion of the project. Short-term, adverse impacts to vegetation within the median would occur.

**Cumulative Effects:** Past, present, and reasonably foreseeable future actions with the potential to affect vegetation include past development in the area and maintenance activities of the road, bridge, parking area, pullouts, and ditch cleaning. These actions have the potential to affect vegetation primarily through the removal and damage of vegetation and potential for the introduction of non-native weed species. These actions have resulted in short- and long-term, negligible to minor, adverse impacts on vegetation in the project area. Impacts added from this alternative come from tree removal and damage, and removal of vegetation primarily in the area where the temporary bridge would be constructed. This impact would be lessened by following topsoil management guidelines during and after project work. Overall, cumulative effects would be short- and long-term, minor, and adverse.

## Historic Structures

### Affected Environment

Isa Lake Bridge is identified in the Grand Loop Road Historic District National Register Nomination, listed in January 2004, as a contributing feature of the Grand Loop Road. Additionally, the park's historic bridges are considered individually National Register eligible, as identified in the "Associated Property Types" significance and NR registration requirements section of the National Register Multiple Property Document addressing Yellowstone's roads and road features, accepted by the Keeper of the National Register in December 1995. The low-profile, log-constructed bridge is significant under NR Criteria C, at the State level, as representing the NPS design philosophy of harmonizing manmade features with natural surroundings.

The history of the design and implementation behind the bridge that exists today was controversial. In 1938, Park Naturalist, C. Max Bauer sent a memorandum to the Superintendent stating his preference for a "simple type of structure" and that the current plans are too elaborate. He wrote, "I am particularly interested in preserving Isa Lake as nearly as possible like it is at present and any structure which would be any higher than the present fill would seem to me to be objectionable."

A September 1940 memorandum to Thomas Vint, NPS Chief of Planning, from Deputy Chief of Planning Thomas Carpenter revealed that a proposed revised location for the road and bridge had been made. The Bureau (of Public Roads, BPR) engineer would be presenting the proposed location of the road and a new architectural plan for the log bridge. In June 1940, Carpenter sent a memorandum to Vint telling him that he had addressed Vint's review comments and was enclosing a set of prints of the revised plans. He stated that almost all the fill shown in connection with the first design had been eliminated. In order to achieve the landscape architects desire "to give the effect that the bridge is crossing the lake and is not the division between two small lakes, it has been necessary to go to a length of some 120 feet in the north elevation." This memorandum brought up the discussion of the use of sidewalks. The NPS was not in favor of adding sidewalks to the Isa Lake Bridge; the Bureau was. Some compromise was presented by the NPS by suggesting that a log curb of 12 inches in width on the northerly side of the bridge would be used for pedestrian traffic. Carpenter felt that the NPS may have to agree to the addition of 1 or 2 feet to the width to avoid raising the height of the railings as designed. Carpenter explained that the Bureau planned to place signs on either approach to the bridge "indicating that this would be zoned for slow speed."

On July 2, 1940, Howard Baker, Regional Landscape Architect, responded to the Chief of Planning in a memorandum regarding the sidewalk issue. In response to the Bureau's insistence that "some sort of walk" be on the Isa Lake Bridge, Baker and the Park Landscape Architect surveyed other Yellowstone bridges with sidewalks. He wrote that many of them showed no wear or usage, which "leads me to believe that we can dispense with walks on bridges except in very congested and highly developed areas". He noted that the addition would complicate construction and increase the cost. Vint agreed that "the additional length of the bridge will help a good deal toward helping the visitor to realize that Isa Lake is one body of water, rather than two. I feel this is particularly important when we point out that the lake is located on the Continental Divide with two outlets, one going to the Pacific and the other to the Atlantic. The revised plans that incorporated the designs the NPS preferred were sent to the BPR office in San Francisco on July 17, 1940. In an attempt to continue to move ahead, Carpenter pointed out that this project was scheduled for the proposed 1941 fiscal year construction season and asked the Bureau to proceed with the preparation of engineering drawings for the bridge "on the basis of our preliminary architectural plans."

By November 1940, the Public Roads Administration was ready to forward the plans to the NPS for approval. Their estimated cost the bridge was \$15,000 and the estimated cost for the grading and parking area was \$17,000.

In October 1941, Senior Highway Engineer Capes filed a location survey report on the project stating that the survey and final plans for the West Thumb area and Isa Lake Bridge area were completed during the winter of 1940-41. Capes wrote that "in order to comply with the requirements of the Landscape Architects, it is proposed to construct a timber bridge across Isa Lake. Its construction is justified primarily by the sentiment attached to the small lake on the summit of the Continental Divide and a desire to preserve the lake, out of which water flows easterly to the Atlantic watershed and westerly to the Pacific." The report stated that the timber for the construction of the bridge would be secured from a West Coast region source and that "there is no particular inducement for pedestrian traffic across the bridge, no sidewalks should be built."

Shortly after Cape's report was sent, the United States entered World War II. Construction activity in the parks virtually came to a halt during the war years. National Park Service Director Newton Drury advised H. K. Bishop, Chief, Division of Construction for the Public Roads Administration, that the Secretary of the Interior was instructed by the War Production Board to discontinue all projects "costing over \$10,000 due to the fact that the aggregate demands of the

war programs for materials, labor, and transportation are so great as to be jeopardized by a continuance of federal non-war projects.” However, the Isa Lake Bridge was completed in July of 1942.

The eight-span timber and log bridge has a maximum span length of 24 feet. Five spans are 24 feet while three spans are 20 feet, measured from center of support to center of support. The bridge is 160 feet in length and has a deck width of 28 feet curb-to-curb. The two-lane bridge has no sidewalks and the deck surface is 5-inch asphalt; the railings are logs, 9 ½ inches in diameter and the bents and pilings are log. The pilings for the trestle piers form a line perpendicular to the bridge center line while the pilings for the trestle abutments form an angle of about 45 degrees with the bridge center line. The abutments are on a line that is nearly north-south. All pilings are capped with an 18-inch diameter cap log. On the outside of the bridge are 22-inch diameter logs spanning longitudinally between cap logs. An untreated deck rests on the cap logs. The guardrail consists of 12-inch diameters log posts rising over the logs that span between the cap logs. These posts are located at the cap logs and at mid-span. They support a longitudinal 14-inch diameter log rail which has a top 1 foot 6 inches above the deck. Originally the plans called for Port Orford cedar pilings treated with salt preservatives, but due to the shortage of the cedar, coast region Douglas-fir treated with Wolman salt was used. The change in wood types resulted in increasing the amount of creosoted bulkhead planks required.

After the bridge was completed, the remainder of the road project, placing the final surface, finishing the fill slopes, obliterating the borrow pits and the obliteration of the old road, was postponed. The park landscape architects reported that the bridge turned out “very satisfactorily, but the approach to the bridge from the Old Faithful end is not well designed as the opposite approach. It appears that we have cut the bridge short and filled unnecessarily into Isa Lake.”

### Intensity Level Definitions

In order for a structure or building to be listed in the National Register of Historic Places, it must meet one or more of the following criteria of significance: A) associated with events that have made a significant contribution to the broad patterns of our history; B) associated with the lives of persons significant in our past; C) embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic value, or represent a significant and distinguishable entity whose components may lack individual distinction; D) have yielded, or may be likely to yield, information important in prehistory or history. In addition, the structure or building must possess integrity of location, design, setting, materials, workmanship, feeling, association (*National Register Bulletin, How to Apply the National Register Criteria for Evaluation*).

The only historic structures within the area of potential effect of this undertaking are the Isa Lake Bridge and the Grand Loop Road. The Isa Lake Bridge is identified in the Grand Loop Road Historic District National Register Nomination as a contributing feature of the Grand Loop Road. The methodology used for assessing impacts to this historic structure is based on how the project will affect the characteristics for which the structure is significant. For purposes of analyzing potential impacts to historic structures, the thresholds of change for the intensity of an impact are defined as follows:

**Negligible:** The impact is at the lowest levels of detection, barely perceptible and not measurable.

- Minor:** Adverse - The impact is measurable or perceptible, but it is slight and affects a limited area of a structure or group of structures. The impact does not affect the character defining features of a National Register of Historic Places eligible or listed structure and would not have a permanent effect on the integrity of the structure.  
Beneficial - Stabilization/preservation of features is in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties.
- Moderate:** Adverse -The impact is measurable and perceptible. The impact change one or more character defining feature(s) of a historic structure, but does not diminish the integrity of the resource to the extent that its National Register eligibility is jeopardized.  
Beneficial - Rehabilitation of a structure is in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties.
- Major:** Adverse - The impact is substantial, noticeable, and permanent. For National Register eligible or listed historic structures, the impact changes one or more character defining features(s) of the historic property, diminishing the integrity of the structure to the extent that it is no longer eligible for listing on the National Register.  
Beneficial - The impact is of exceptional benefit and the restoration of a structure is in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties.

\*Note that the definition of "adverse impact" per NEPA does not necessarily correlate to adverse affect per the National Historic Preservation Act. You can have adverse impacts without rising to the level of adverse affect.

### Impacts of Alternative A- No Action

Under Alternative A, the historic bridge would continue to deteriorate. Reconstruction of the bridge would not occur. The no action alternative would constitute benign neglect and would eventually result in the collapse of the bridge and closure of thru traffic on the Grand Loop Road. No action constitutes neglect under the Criteria of Adverse Effect, and the closure of the Grand Loop Road would constitute isolation and alteration of character defining features of the National Register eligible road, a criterion of adverse effect. Safety concerns related to allowing traffic on the bridge would continue to grow, and eventual closure of the bridge would occur. Therefore, this alternative has the potential to have long-term, moderate adverse impacts to one or more of the park's historic properties. In terms of Section 106, Alternative A would eventually have an adverse effect on historic resources.

Cumulative Impacts: Past, present and future actions that affect these historic properties would have an affect considered to be minor. Most of these actions in the past, and envisioned for the future would be from bridge and pullout maintenance related tasks such as pavement overlays, and ditch cleaning efforts.

### Impacts of Alternative B (Preferred Alternative) - Reconstruct Bridge on Existing Alignment

This alternative would replace in-kind or with suitable alternative materials, as identified through consultation with the Wyoming State Historic Preservation Officer, the entire bridge in its present location and would have a minor impact on the Grand Loop Road Historic District. Reconstructing a new bridge in its present location would not require any change in the existing

alignment. In order to do this, a temporary two-lane bridge would be constructed. After reconstruction of Isa Lake Bridge is completed, the temporary bridge would be removed.

Reconstructing the bridge in its current location to strengthen its substructure and replace the wooden deck, curbs, railings, and other elements to meet current code as identified in the Secretary of the Interiors Standards to allow the bridge to retain its low profile, log character, and current function constitute a moderate beneficial impact. The Wyoming State Historic Preservation Officer has been consulted at the initial and 30 percent stage of design development to insure that the bridge's character-defining features are identified with WYSHPO concurrence. Yellowstone National Park and the WYSHPO have consulted on the best practical solutions to be applied to the reconstruction and rehabilitation of the bridge to provide a structure that can withstand modern vehicle weights but retain its historic integrity.

The Wyoming State Historic Preservation Officer, Federal Highways Administration staff, and Yellowstone National Park staff are working collaboratively to avoid adverse affect to the historic bridge through design and materials selection to the extent allowed by the Secretary of the Interior's Standards to produce a bridge that retains its historic integrity.

Cumulative Effects: Past, present and future actions that affect this historic structure would have an affect considered to be minor. These past actions in combination with the proposed actions under this alternative would result in long-term, moderate, and adverse impacts, but are considered no adverse affect under the Section 106.

## Visitor Use and Experience

### Affected Environment

People from around the world come to YNP each year to experience its wonders. Over the past decade, annual visitation to YNP averaged approximately 3 million visitors. Visitation is highly seasonal. June, July, and August are the months of highest use, with 50 percent of the park's visitors arriving in July and August. The shoulder- season months of May and September receive less use, but the volume is still substantial. Studies done in 1989 and 1992 estimated that 74 to 81 percent of all park visitors came from outside the surrounding states of Idaho, Montana, and Wyoming. Seven percent of Park visitors are international, with about half of them coming from Canada; Germany contributes the second largest number. About half of the people coming through Yellowstone's entrances are repeat visitors (Littlejohn, Dolsen, and Machlis 1990).

The NPS is concerned about the safety of visitors to its parks and will cooperate with proposals to enhance visitor safety as long as those proposals do not result in a derogation of NPS resources or conflict with the current or planned use of NPS property (NPS 2006). The *NPS Management Policies 2006* state the NPS is committed to providing appropriate, high-quality opportunities for visitors to enjoy the parks. The policies also state, "While recognizing that there are limitations on its capability to totally eliminate all hazards, the NPS and its concessionaires, contractors, and cooperators will seek to provide a safe and healthful environment for visitors and employees" (sec. 8.2.5.1). Further, the NPS will strive to protect human life and provide for injury-free visits (sec. 8.2.5).

The Isa Lake area is heavily used by park visitors due to its location astride the Continental Divide. Opportunities to view the kiosk and photograph the lake in the summer when it is filled with yellow pond lilies are popular. For visitors with short itineraries, small children, or limited physical abilities, the Isa Lake area provides an enjoyable visitor experience. Isa Lake is thought to be one of the only lakes in the world whose waters flow into two oceans.

## Methodology and Intensity Level Definitions

Analyses of the potential intensity of impacts to visitor use and experience were derived from available information on visitor use of Yellowstone Park and staff knowledge of visitor travel patterns and use levels. The thresholds of change for the intensity of impacts to visitor use and experience are defined as follows:

- Negligible:** Changes in visitor use and experience would be below or at the level of detection. The visitor would not likely be aware of the effects associated with the alternative. The impacts on visitor use and experience would not be measurable or perceptible.
- Minor:** Changes in visitor use and experience would be detectable, although the changes would be slight. The visitor would be aware of the effects associated with the alternative, but the effects would be slight, short-term, but would be limited to a relatively small number of visitors at a localized area.
- Moderate:** Changes in visitor use and experience would be readily apparent. The visitor would be aware of the effects associated with the alternative and would likely be able to express an opinion about the changes. The effects would be readily apparent and result in substantial, noticeable effects on a local scale on a short- or long-term basis.
- Major:** Changes in visitor use and experience would be readily apparent and severely adverse or exceptionally beneficial. The visitor would be aware of the effects associated with the alternative and would likely express a strong opinion about the changes. The impacts on visitor use and experience would be substantial. Effects would be readily apparent and result in substantial, noticeable effects to safety on a regional scale and long-term basis.

## Impacts of Alternative A- No Action

Under Alternative A, Isa Lake Bridge would not be reconstructed. The bridge would continue to deteriorate until it is no longer operative and able to maintain visitor access on this section of the Grand Loop Road. Up until that time the NPS would still 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. Closure of this section of road would affect patterns of visitor use in several ways by increasing travel times and distances and making it difficult for single day loop trips. Improvements would not be made to the existing parking area. Parking spaces would not be delineated and the asphalt parking lot and pullout not resurfaced. The historic kiosk would continue to deteriorate and would not be repaired. Overall, the no action alternative would result in local, short and long term, moderate, adverse impacts on visitor use and experience.

Cumulative Effects: Past, present, and reasonably foreseeable future actions with the potential to affect visitor use and experience include periodic bridge maintenance and eventually complete closure. These actions have the potential to affect visitor experience through occasional noise disturbance and bridge restrictions and traffic delays during maintenance work. Complete closure would restrict access on this section of the Grand Loop Road. Overall, these actions would result in short and long term, minor to moderate, adverse impacts on visitor use and experience.

## **Impacts of Alternative B (Preferred Alternative) - Replace Bridge on Existing Alignment**

Under the preferred alternative, two lanes of traffic would flow on the temporary bridge alleviating the need for most construction delays for visitors. There would be short-term delays of up to 30 minutes during construction though these would not occur on a regular basis. These delays would be an inconvenience for visitors traveling this section of the Grand Loop Road. No trailheads or picnic areas would be impacted. The pullout at the kiosk would be closed and stopping to photograph and view Isa Lake would not be allowed during construction.

Construction noise during the day would also be noticeable to visitors, but would be temporary and likely not heard from any surrounding trails. Hauling of project materials through the park would cause a negligible amount of noise in developed areas. Increased truck traffic would have a negligible impact to traffic flow. The resulting adverse effects would be temporary during construction and would cease after completion of the project. Reconstruction of the bridge would have moderate, long-term, beneficial impacts to visitors by ensuring continued access over Craig Pass. Long-term, minor, beneficial impacts would occur from improvements made to the existing parking area, delineating parking spaces, resurfacing asphalt in the parking lot and pullout. The historic kiosk would be repaired. Universal access would be improved with installation of a curb cut and a delineated handicap parking space near the existing kiosk. Safety concerns would be improved by moving the Continental Divide sign to the west and reducing the speed limit.

Cumulative Effects: Past, present, and reasonably foreseeable future actions including road and bridge maintenance, and emergency stabilization have affected visitor experience through noise disturbance and bridge restrictions during project work. These actions have resulted in short-term, negligible to minor, adverse impacts on visitor experience. There would be minor adverse effects to the visitor experience during construction. Overall, under this alternative, the visitor experience would improve with the reconstruction of the bridge, parking and pullout improvements, addition of a curb cut, kiosk repairs, and widening of the travel lanes. Cumulative effects would be both short-term negligible to minor and adverse, and long-term and beneficial.

## **CONSULTATION AND COORDINATION**

### **Internal Scoping**

Scoping is a process used to identify the resources that may be affected by a project proposal, and to explore possible alternative ways of achieving the proposal while minimizing adverse impacts. Internal scoping was conducted by an interdisciplinary team of professionals from YNP. Interdisciplinary team members met in October and early November 2011 to discuss the following: purpose and need for the project; various alternatives; potential environmental impacts; past, present, and reasonably foreseeable projects that may have cumulative effects; and possible mitigation measures. The team also gathered background information and discussed public outreach for the project. Over the course of the project, team members have conducted numerous individual site visits to view and evaluate the proposed construction site.

### **External Scoping**

External scoping was conducted to inform the public about the proposal to replace Isa Lake Bridge within the existing alignment and to generate input on the preparation of this EA. This effort was initiated with the distribution of a scoping letter, in July of 2012, which was mailed to 169 interested parties. In addition, the scoping letter was posted on the NPS Planning, Environment, and Public Comment (PEPC) website. A press release was also sent to local news organizations and the public was given 32 days to comment on the project. During the external scoping period, 6 pieces of correspondence from the public through postings on the PEPC website and letters. Most comments were in support of the project and no substantive comments were submitted.

### **Agency Consultation**

In accordance with the Endangered Species Act, the NPS contacted the U.S. Fish and Wildlife Service with regard to federally listed special status species for the Parkwide Road Improvement Plan in 2008 which includes the road over Isa Lake Bridge. A biological assessment was prepared by the park, and a subsequent biological opinion was issued by the U.S. Fish and Wildlife Service.

In accordance with §106 of the National Historic Preservation Act, the NPS provided the Wyoming State Historic Preservation Officer an opportunity to comment on the initial effects of this project. Early consultation with WYSHPO on the designs of the bridge's character defining features was submitted in April 2012 with WYSHPO's concurrence on May 5, 2012 to "no adverse affect" to Isa Lake Bridge and the Grand Loop Road Historic District at the early stage of design. Final plans will be submitted for final review of project effect when they are completed.

### **Native American Consultation**

A scoping letter describing the proposed action was mailed to 73 tribal members of Yellowstone's 26 associated tribes in July 2012, to solicit concerns and comments for the proposed project. The park did not receive any responses. The following tribes were consulted:

Assiniboine & Sioux Tribes, Fort Peck  
Blackfeet Tribe  
Cheyenne River Sioux Tribe  
Coeur d'Alene Tribe  
Comanche Tribe of Oklahoma  
Confederated Salish and Kootenai Tribes



Confederated Tribes of the Colville Indian Reservation  
Confederated Tribes of the Umatilla Indian Reservation  
Crow Creek Sioux Tribe  
Crow Tribe  
Eastern Shoshone Tribe  
Flandreau Santee Sioux Tribe  
Gros Ventre and Assiniboine Tribes  
Kiowa Tribe of Oklahoma  
Lower Brule Sioux Tribe  
Nez Perce Tribe  
Northern Arapaho Tribe  
Northern Cheyenne Tribe  
Oglala Sioux Tribe  
Rosebud Sioux Tribe  
Shoshone-Bannock Tribes  
Sisseton-Wahpeton Sioux Tribe  
Spirit lake Sioux Tribe  
Standing Rock Sioux Tribe  
Turtle Mountain Band of Chippewa Indians  
Yankton Sioux Tribe

## **Environmental Assessment Review and List of Recipients**

The EA is subject to a 30-day public comment period. To inform the public of the availability of the EA, the NPS will publish and distribute a letter to various agencies, tribes, and the 169-person mailing list, as well as publish a press release. The document will be available for review on the PEPC website at <http://parkplanning.nps.gov/>. Copies of the EA will be provided to interested individuals, upon request.

During the 30-day public review period, the public is encouraged to submit their written comments to NPS, as described in the instructions at the beginning of this document. Following the close of the comment period, all public comments will be reviewed and analyzed, prior to the release of a decision document. The NPS will issue responses to substantive comments received during the public comment period, and will make appropriate changes to the EA, as needed.

## List of Preparers

The following persons assisted with the preparation of the EA.

### Management:

- Dan Wenk, Superintendent, YNP
- Steve Iobst, Deputy Superintendent, YNP

### Preparers (developed EA content):

- Doug Madsen, Outdoor Recreation Planner, YNP
- Vicki Regula, Environmental Protection Specialist, YNP

### Interdisciplinary Team (developed alternatives, provided technical input and conducted review of the EA):

- Heidi Anderson, Botanist, YNP
- Brian Collins, Designer, FHWA
- Elaine Hale, Archeologist, YNP
- Cheryl Jaworowski, Geologist, YNP
- Fahmi Ismail, Structural Engineer, FHWA
- Connie Kratovil, Project Manager, FHWA
- Khoa Nguyen, Structural Engineer, FHWA
- Dan Rhodes, Landscape Architect, YNP
- Colleen Smith, Designer, FHWA
- Nancy Ward, Chief of Maintenance, YNP
- Jennifer Whipple, Botanist, YNP

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